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EXPLORATIONS IN THE GREAT BEAR LAKE REGION.*

By J. MACKINTOSH BELL, M.A.

Throughout the Dominion of Canada still lie immense tracts of country where the white man has never been, and where the few wandering savages who there make their home are still as wild and uncivilized as in the days of Columbus. The day is not far distant when much of this great region will support a thriving population, but the arctic part of it must remain, from climatological reasons, as it is now, a great northern wilderness, a home fit only for savages, and a refuge for caribou, musk-oxen, and other northern animals.

My recent explorations in the Mackenzie river region of Northern Canada, undertaken in pursuance of instructions received from Dr. Robert Bell of the Geological Survey of Canada, extend northwards from the 60th parallel N. lat. to the Arctic ocean. In this paper I would like to deal more particularly with the country around Great Bear lake to Coronation gulf and the Coppermine river, and southwards towards Great Slave lake. I was preceded in this region by the explorations of Sir John Franklin and Sir John Richardson during the early part of the last century, and towards the middle of the century by the latter, with Messrs. Dease and Simpson, and I had, naturally, some diffidence in doing work in a country which had previously been visited by such able men. However, the eastern part of Great Bear lake was before our visit unknown, and in our journey southward from Great Bear lake to Great Slave lake we passed through a thoroughly unexplored country, rarely visited even by the natives, and known only by the writings of that wonderful traveller, the Abbé Pétitot.

We started from Fort Resolution, a Hudson's Bay Company's post on Great Slave, on April 11, and crossed to the outlet of the Mackenzie

* Read at the Royal Geographical Society, May 13, 1901. For discussion see p. 43. Map, p. 352.

river. Here we were obliged to wait till the ice broke up on May 12, and soon after started down-stream by canoe. Below Fort Simpson the Mackenzie, after its junction with the Liard, becomes a magnificent stream, being for the most part over a mile in width, and with a current of from 3 to 6 miles an hour. Its beautiful spruce-clad shores are hemmed in by the eastern Rocky mountains, which rise majestically, a veritable "Mer des Montagnes," on either side. We started from Fort Norman, in lat. 64° 55′ N., on June 16, leaving behind the last trace of even a semi-barbarous civilization. Soon after our departure from the last-named place we commenced the ascent of the Bear

OLD SHORES OF GREAT BEAR LAKE, CAPE MACDONNELL.

river, a stream somewhat swifter than the Mackenzie. At the time of our visit, travelling was particularly difficult. The ice of the Bear river had broken up only a few weeks before, and was piled all along the bank, 10, 20, and in places even 30 feet above the water, so that my men, in hauling our canoes by means of tracking lines, were obliged to walk on the top of this high border of ice. The Bear river is a fine, clear-watered stream, 350 yards in width at its mouth, and about 250 yards at its outlet from Great Bear lake. Leaving the Mackenzie, the river flows through a deep wooded valley, whose steep slopes show exposures of unaltered, horizontally bedded Tertiary strata. Some 40 miles up we entered that spur of the Rocky mountains which had crossed the Mackenzie below Fort Simpson,

and here for 2 or 3 miles the river runs through a deep cañon, having cut its way down in places 300 feet. Just below the rapid of the cañon the mountains rise in a series of peaks of anticlinal structure, called by Sir John Franklin, the *Mountains* at the *Rapid*. The highest of these peaks, Mount Charles, does not exceed 1500 feet in height, but its rough, jagged outline, its steep slopes of talus blocks, and its sombre colouring greatly increase its apparent height. The Rocky mountains are here composed of altered limestones, dolomites, breccias, and quartzites, all much contorted. A few fragmentary fossils were found, which show the rocks to be of Ordivician age. The walls of the cañon are

OLD SHORE LINES (TERRACES), NORTH SHORE, MACTAVISH BAY, GREAT BEAR LAKE.

formed of almost unaltered and nearly horizontal Cretaceous sandstones, shales, and marls, and through these soft strata the Bear river has easily worn itself a deep bed. This erosion is going on rapidly at present, the swift current of the Bear river being materially aided by the intense cold of the subarctic winter. In the 40 miles intervening between the cañon and Great Bear lake, the river meanders through a deep wooded valley, with terraces showing the former levels of the stream, which may have been of greater breadth in comparatively recent times. Gravel beds of great thicknesses, sometimes associated with Archæan boulders and sand, are exposed along the river-bank. How these great masses of gravel could have been formed is more or less a matter of conjecture, as they are overlaid by boulder-clays of the later

glacial period. If of pleistocene origin, they must have been laid down quite early in that epoch. On the other hand, they have been deposited since Cretaceous times, as they overlie Cretaceous strata. It is probable that the deposition of gravel continued uninterruptedly from Tertiary into Pleistocene times.

Reaching Great Bear lake on June 23, we were disappointed to find that the ice of the lake was still as continuous as in mid-winter. This was anything but an encouraging outlook to greet our arrival, and it was made the worse by the news which the Indians brought in a few days afterwards. They told us that they had crossed from the north-east end of the lake by dog-team, and that we need not expect the ice to break up for at least three weeks' time. These Indians, belonging to the Hareskin tribe, came under the leadership of their chief, Itzekah, a native of the most objectionable type. He wanted to know whence I had come, what was my reason for being there, and if the great white mother had sent anything for them. He told me that he wished me to understand that we were to kill no caribou in his country, because, if the white man killed one of these animals, all the rest would disappear. Finally, however, by giving him presents of black tobacco, and by amusing him and his band in various ways, they became quite cordial, told us where we would get the best fish, where the most of the caribou were, and, as a last concession, the chief agreed to have some of his band waiting for us on August 15 at the south-east extremity of the lake to guide us across country to Great Slave lake. The Hareskin Indians are, for the most part, a harmless, good-natured race, living on the fish they catch or the deer they kill. As a rule, at least once a year they travel to the Hudson's Bay Company's post at Fort Norman, to trade their dried meat and furs. They are as yet little civilized, though the majority have recently been Christianized by the Oblate Fathers. They are rather a handsome race, being tall and well built, and their picturesque deerskin coats and leggings, ornamented with beads and porcupine quills, give them a pleasing appearance.

Fortunately, the Indian forecast as to the break-up of the ice was a little overdrawn. The lake was sufficiently clear to enable us to start around the north shore on July 4, although it was the 12th before we reached Richardson bay, having had numerous delays, occasioned by the ice packing up against the shore. Leaving Richardson bay, we decided to follow an old Indian portage-route by small lakes, across the Sweet Grass Hills peninsula, rather than attempt to go round the shore past Gros Cap, where the ice was still packed tight. Here I hoped also to learn something both of the geology and geography of the interior. Reaching Icebound bay, we were again delayed by the ice, and it was not till the 25th, and then only by breaking our way through the ice for 4 miles, that we were able to make the traverse across Smith bay to the north shore.

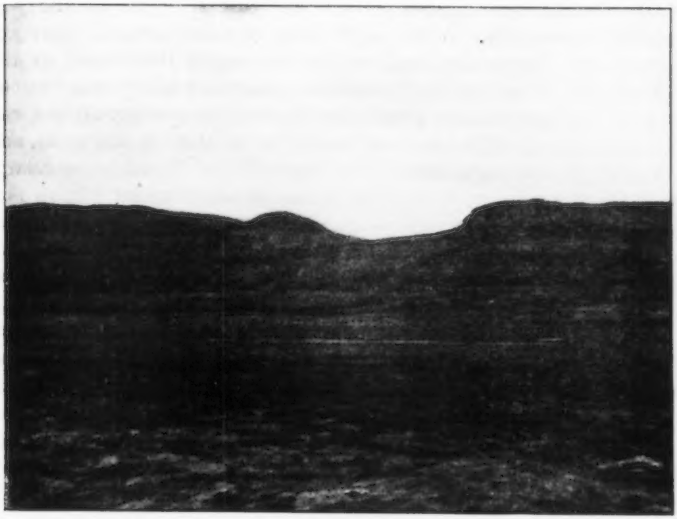
WIND-COVERED TREES, EAST SHORE, RUSSELL BAY, GREAT BEAR LAKE.

We reached old Fort Confidence, at the extreme north-east of the lake, on July 30. Here it was that Sir John Richardson and Dr. Rae wintered during their search after traces of Sir John Franklin. We were surprised to find the log houses of the fort still in good condition, though almost half a century had elapsed since their occupation, more especially as not even the chimneys were standing of Franklin's post at the outlet of the Bear river. Not a single nail had been used in the buildings of Fort Confidence, but skilful dovetailing had given the houses both neatness and durability. The fort is situated in a sheltered place behind a big island, with rising ground to the north of it. Its location is one of the few well-wooded spots on the lake, and the trees are of fine growth, worthy of a more southern latitude. The ground had been free from snow for some weeks, and was covered with green moss, interspersed with many-coloured flowers, which mature quickly during the season of perpetual sunshine. The park-like appearance of this far northern spot was indeed refreshing after the dreary shore we had passed along since leaving the outlet of the lake. The northern and north-western shores of Great Bear lake present no very interesting geological features. To within 30 miles of Fort Confidence the lake is surrounded by unaltered Cretaceous strata, with few exposures of solid rock. Hard sandstone, interstratified with loose shale, is exposed in a long anticlinal fold, the backbone of the Sweet Grass hills. On Icebound bay I noticed excrescences of sulphur and alum. From a point about 30 miles west

of Fort Confidence, as far east as the Coppermine river, the rocks exposed are similar to those of the copper region of Lake Superior, and are probably referable to the Nipigon or Keewanawn of the Lower Cambrian system. They consist of dolomites, quartzites, shales, grits, and conglomerates, dipping at all angles. These strata are much folded and contorted, and they are cut by numerous greenstone dykes.

From Fort Confidence, ten days were occupied in making a traverse across country to the Coppermine river. On the fifth day out, we reached this stream at a point about 15 miles from its mouth. It is here a fine large river, about half a mile in width. We were pleased to see, after the Barren Lands we had passed over since leaving Great Bear lake, that a few spruce trees grew in the river's sheltered valley, though none of them was of large size. The country in this vicinity is particularly dreary and desolate; geologically, however, it is of great interest. The Copper mountains, which follow the Coppermine for some distance, have a maximum height of about 1600 feet. The lowest exposures are of stratified sandstones and grits, with amygduloid above, cut in several places by immense intrusive sheets of greenstone. They often form perpendicular walls relieved at the foot with talus slopes. Evidences of glaciation are striking. The hard rocks have been scored and grooved by the ice. Glacial mounds or drumlins, some of which are 200 feet in height, with long winding lateral moraines, show the path of the glacier.

OLD FORT CONFIDENCE, NORTH-EAST END OF GREAT BEAR LAKE.



TUNDRA COUNTRY, SOUTH OF CORONATION GULF.

Returning from the Coppermine, we fell in with a party of Eskimo, who ran from us as we approached, in spite of all our efforts to restrain them. But, as a matter of fact, even had we been blood-thirstily inclined, we would have put up a poor fight, because both my assistant and I were quite tired out, and my men had gone on some hours before us. It seems rather incredible that twenty-five Eskimo would run from two played-out white men; but it is quite probable that they may have expected an army behind us. Their camp was a most extraordinary place. It lay on a hillock of sand, with a large lake in front and a pond behind. The knoll was capped with three or four small huts, the walls of which were formed of flat stones placed on end, and the roofs of caribou-skin. The pond was filled with caribou-bones, which showed that the camp had been much frequented. In the middle of the miniature village lay a large heap of raw caribou meat, which the Eskimo store up in seasons of plenty. We waited some time at the camp, hoping the natives would reappear, but they did not. It was their period of good feeding. The caribou were grazing on the Barren Lands in vast herds, and musk-oxen were plentiful, so there was no necessity for them to return to their extra food-supply. They had evidently never come in contact with white men before, because no article of civilized manufacture was found in their camp. We left what we could for them, and continued our way southward against a snow-storm which had set in over the

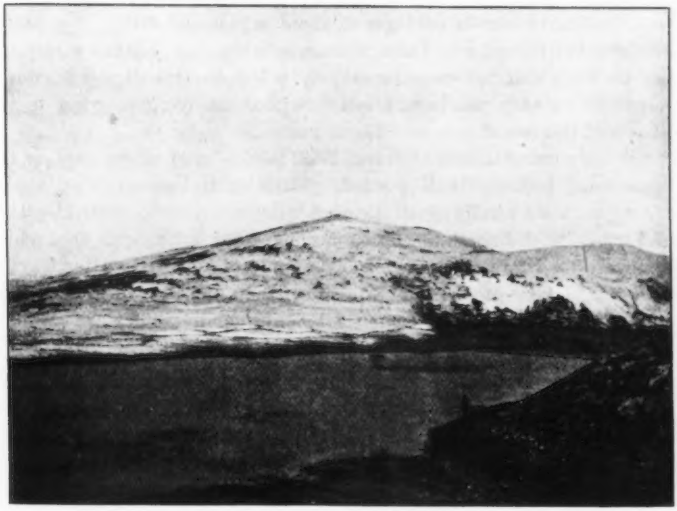
Barren Lands. Next day we crossed the Dease river, the boundary of the Eskimo country. A few days later we had occasion to return towards the Coppermine, and at the crossing of the Dease, on the Eskimo side, three caribou-bones stood, sharpened and pointed in our direction. Some of these people had followed us secretly all the way from their camp. They had watched us as we slept in the rocks, and had only turned back when they reached the Hareskin boundary. What the strange sign of the three bones could have meant, I know not. It may have warned us to never again enter the Eskimo country, or else it may have been a sign of friendship to us from one of the aboriginal bands still left on the American continent who have as yet had no dealings with the white man.

We left Fort Confidence going southward along the eastern shore of Great Bear lake on August 13, and coasted the southern side of Dease bay. For about 20 miles the country is interesting, being rocky and thinly wooded, but beyond that, as far as Cape MacDonnell and eastward from it along the northern shore of MacTavish bay, the shore-line is particularly monotonous—a low treeless waste, broken only by hills of gravel and huge glacial erratics. One feature here is, however, of great geological interest. On the northern shore of Dease bay I had noticed terraces of sand and gravel, showing former shore-lines of the lake, extending back from the present lake-edge to a distance of a mile and a half, the greatest height being about 300 feet. Along the northern shore of MacTavish bay I found these same terraces of gravel extending into the interior at heights of 10 to 20 feet, and more. The height of these terraces is much greater than those met with in the south-east and south-west, and may show a gradual tilting of the lake-basin toward the south. The eastern shore of MacTavish bay is rugged and mountainous. The cliffs often rise 1000 feet almost perpendicularly from the water's edge. The rocks are a series of basic eruptives, similar to certain greenstones which extend some distance south of Great Bear lake, where they are replaced by granites and gneisses, the typical Laurentian of North America. All these rocks weather to beautiful shades of purple, red, and brown, and the reflections of the coloured precipitous cliffs in the clear northern waters, with the brilliant arctic sunlight, were singularly beautiful. Difficulty was occasionally met with in finding a landing-place, but as a rule sheltered harbours were found in which the scenery would delight the eye of any connoisseur of the beautiful.

Reaching the appointed place on the southern shore of Great Bear lake, we were disappointed to find that the Indians, who had agreed to meet us there and guide us south to Great Slave lake, had already left for their hunting-grounds. We could not grumble at this, however, as it was quite two weeks later than the time we had agreed to arrive, having been delayed longer than we had expected. They had probably given

us up as lost, a fate which they think will overcome all white men who travel in their inhospitable country. We were thus obliged to start across country without a guide, a course which I did not at the time like to undertake, as we knew nothing of the district, and had only a scanty supply of provisions. We ascended the Camsell river, a fine rapid stream much broken by waterfalls, and pushed on through its expansions, some of which are lakes of considerable size. Portages were frequently made to avoid dangerous rapids, or to shorten the distance by portaging from lake to lake rather than by following the great bends of the river.

I often climbed hills to look over the lie of the land, and thus ascertain



DRUMLINS (GLACIAL MOUNDS), BARREN LANDS, SOUTH OF CORONATION GULF.

the best places to make portages from lake to lake. Some 30 miles up the Camsell river we portaged into a large lake, known to the Indians as Lake Hottah, or Two-year-old Moose lake. It is over 40 miles in length by fully 10 miles in width. Its surface is a maze of islands, which made the surveying of it particularly difficult. The scenery here was very fine. High blue hills rose to the westward, the numerous islands were well wooded, and reminded one of the Thousand islands of the St. Lawrence river, and the water was of a limpid clearness. Leaving Lake Hottah, a short portage brought us into Lake Stairs, an expansion of the Camsell river, which we followed from this lake as far as the height-of-land, passing through its numerous expansions. The last lake of considerable size before reaching the height of land was Lake Dawasonecha, or the Lake of the Small Rat's House. It is a magnificent sheet of

water, fully 25 miles in length by 10 in width, filled with fish of all the kinds common to Northern Canada. To the east and south of this lake a low range of hills, the Eastlake mountains, rise to a height of about 1300 feet. A view from the top of this range showed a tree-covered country dotted with lakes in all directions as far as the eye could reach.

Near Dawaso-necha lake we were fortunate enough to meet some Dogrib Indians, who agreed to guide us across the height-of-land to Great Slave lake. Crossing the low swampy ridge, we reached the waters of Summit lake, which empties by the Marian and Petitot rivers into Lake Marian, the northern expansion of the Fort Rae arm of Great Slave lake. We descended the Marian to its junction with the Petitot river, making numerous portages to avoid rapids and falls. We passed down the Petitot river to Lake Marian, whence our journey across the lake to Fort Rae, the most northerly point in this direction, was a comparatively easy one, but attended with some danger owing to the lateness of the season.

All the country south of Great Bear lake, almost as far east as the Coppermine, is fairly well wooded. The Dogrib Indians who inhabit this region are a kindly, good-natured tribe, superior to their Hareskin neighbours to the north. The numerous lakes teem with fish, which with waterfowl formed the chief food-supply of my party after leaving Great Bear lake. Moose and bear are common, while caribou at certain seasons of the year are still plentiful; but year by year these animals, which formerly inhabited the whole country east of the Mackenzie, have been pushed gradually northward, so that places which they visited as recently as six years ago, know them no more. Every year the Indians and Eskimo kill thousands of them for their tongues alone, and even for the "sport" of killing them, so that there is a probability in the near future of this beautiful and useful animal sharing the fate of the North American buffalo.

A JOURNEY FROM ZEILA TO LAKE RUDOLF.*

By JAMES J. HARRISON.

THE object of our expedition was to carry a complete survey through the Hawash valley to Lake Rudolf, and if possible across to the Nile, at the same time combining a sporting trip in which attention was to be directed to the beasts and birds of the countries visited. On November 5, 1899, we landed at Aden, our party consisting of Mr. A. E. Butter, Mr. P. G. Powell-Cotton, Mr. W. F. Whitehouse, and myself. As surveyor we had Mr. Donald Clarke, who had already had some twenty years' experience of surveying work in different parts of Africa; while Mr. R. Perks went as taxidermist. A few hours' delay to make final

* Map, p. 352.

arrangements with Messrs. Cowasjie Dinshaw found us and stores on board the *Woodcock*, another fourteen hours landing us at Zeila on November 9, 1899.

It took us five days' hard work to repack and arrange our loads, engage boys (who asked enormous wages), and collect more transport. We were lucky enough to induce Mohamed Hassan, a Somali boy, to go as our headman, he having already done much of the country with poor Captain Wellby. Besides speaking good English, Abyssinian, Galla, and innumerable other tribal languages, he proved himself to be quite the hardest-working man I ever met. We engaged a splendid lot of boys, in all about 61, chiefly those accustomed to long trips, most having been with Lord Delamere, Dr. Donaldson Smith, Captain Wellby, or Mr. Cavendish. We knew at the outset that our journey was undertaken at the worst possible time, owing to the unprecedented two years' drought which had extended over the whole of East Africa to the Nile. Our transport, to begin with, was sixty camels (twelve for water) purchased, and twenty hired to Gildessa, but the latter were afterwards replaced by bought ones, for which we sent back to Berbera, they following us loaded with rice. To Gildessa our route is fairly well known. Owing to drought we had to make some long marches, doing 164 miles in twelve days—an average of 13½ miles a day—mostly between the hours of 2 and 9 a.m.

The country varies from the hard sandy plain covered with rough short scrub to undulating hills covered with rocks and boulders. Grass, of course, was out of the question, but our camels picked a living among the mimosa trees. For our ponies we carried a little corn and fodder, but on reaching Gildessa we owned another fortnight of such country would have ruined our transport.

The game we found consisted of Semmering's gazelle, Pelzeln's gazelle, Waller's gazelle, Beira antelope (in the high Marmar mountains at Aroweina), the beautiful lesser koodoo, greater koodoo, and wart-hog. On shooting the latter, how one hated Somali boys and their Mohammedan religion! for nothing would induce them to touch the animal, so all the loading, bringing into camp, skinning, drying, and even packing every day for the march, had to be done by the white man. More than this, any sack, rope, or knife touched by the poor pig was defiled, and had to be destroyed. Smaller animals included the beautiful little dik-dik, lynx, jackal, fox, hare, with numerous guinea-fowl, bustard, eagles, and vultures. One of the latter measured 110 inches from tip to tip of wing, standing 42 inches high, while the span of the claws was 9½ inches.

Between Hensa and Lasman the country is all volcanic, and terribly hard marching for camels. Water had to be carried nearly every other march, all the streams being dry, and most of the Somali wells too. At Aroweina the wells are 28 feet deep in the river-bed, and yet there is hardly any water. On November 22 we camped in the dry bed of a

stream, Beja Kaboba, just under a conical-shaped hill with a small stone fort flying the Abyssinian flag. We very soon had a state visit from the governor and garrison, consisting of an outpost of four men. Having fired numerous salutes, we entered into conversation over a glass of brandy, and found we were expected, notice of our coming having been sent down by the Emperor Menelik. In this district we found lesser koodoo fairly plentiful. Here we unfortunately began losing our camels, no doubt owing to their eating that scourge of a plant called "gumbot," which is poisonous. Having got our caravan into fairly good working order, we began the daily task of drilling our retainers, 50 of whom were armed with government rifles from Aden. On November 26 we reached Gildessa, escorted to our camping-place by the whole population. After lunch, our worthy friend the Shum "Alto Zavike" came in state to call. Nothing could equal the kindness we received while staying here two days: presents of sheep, goats, honey, milk, eggs, bread, and firewood came in daily. To our great joy we found four good mules awaiting us, kindly sent down by Colonel Harrington, also letters saying the Emperor had given us leave to travel by a new route through the Hawash valley, and would be pleased to see us at Adis Abbeba. Being short of transport, we left eighteen loads of durra and rice to follow with hired camels when Mohamed should come with our second detachment. We could only buy six donkeys and a few sheep and goats (the latter for milk).

On November 28 we left Gildessa, accompanied by a large following, our road lying through thick scrub, while we wended our way by sheep-tracks between high ranges of hills, camping at a place called Odah. During our march we crossed two running streams, the first running water since leaving the coast. These streams join two other rivers—the Gildessa and Odah; but following them down some 20 miles, we found them disappear through running out and sinking into the earth, a rather common occurrence in Northern Africa. For some days our course lay due west along the foot of a lofty range of broken mountains, called the Kobul hills. I climbed these one day after large koodoo. The rocks were awful, evidently all due to very recent volcanic action. Our camels here looked very bad; so, resting a day, we made a big koodoo into strong soup, and gave each camel a good drink, which seemed to effect a wonderful change. Along this valley we found several nice streams running. On December 4 we camped at a series of water-holes called Ulfulu, around which were gathered hundreds of camels, goats, and sheep. Here, also, we had to sit and undergo at least an hour and a half of native war-dances, given by three neighbouring chiefs and forty of their followers clad in full war-paint. Another march brought us to the river Herrar, on the banks of which we found some lovely trees to camp under. Here our Gildessa guides and twelve hired camels left us, the country ahead

belonging to a powerful and independent chief called Tumbacha. A two hours' march brought us to his village called Korta, a short distance from which we discovered what had once formed two good lakes, but was now only a huge marsh overgrown with dense reeds. The chief, a most unprepossessing individual, paid us a long visit. He began by demanding absurd presents before letting us pass, and after hours of talking, he and his retainers all left in a by no means friendly manner. Having no thorns with which to make a zereba, we stored our baggage as a rampart, doubled all sentries, and served out ball cartridge. This chief has for years caused the emperor great trouble, fighting his people and raiding caravans; so lately he has been kept quiet by the payment of an annual sum. For this reason we were most anxious to part friends, especially as our second detachment of loaded camels was behind. We moved on for two days, when, finding some excellent grass, we determined to camp, sending back eight armed men to help our rear convoy in case of trouble. Before they arrived, Tumbacha had beaten two of our men and tied them up until they promised to give him a camel-load of rice and two bales of cloth. We were thankful to see the rest march into camp, but it was hard to prevent our boys from going back to fight and burn the village.

On December 10 we reached a small lake called Odah. From the contour of the land, which showed the well-marked dip of the old shore, this lake had once been a very large sheet of water. Here we had some good duck and geese shooting, and I was also lucky in getting an "ant-eater," a small but very rare animal. A lofty mountain range called Garamaldit stretched many miles east and west just south of our course. During our next day's march my mule ran away for the third time, coming to grief in a fox-hole, but neither of us was much the worse apart from some bruises. I had hopes that this fractious animal would settle down with careful handling, but after this I christened him "Oom Paul," as I had no hopes of his mending his ways until one of us had come to grief. On December 12 we crossed a river called Mukla, rising in the lofty mountains to the south, of which the highest is known as Mount Assobat. Rising ground all the 13th brought us to Dunkaga (3770 feet), the 14 miles having been done under terrible heat. Next day we made a forced march of nine hours, doing 18 miles over an endless plain called Aleaduga, on which we saw thousands of camels feeding, and also met with our first zebra, oryx, and hartebeest. We finally camped at Bilen hot springs. The temperature of the water was 110°, springing up in a pond about 30 yards across, clear as crystal. We enjoyed an evening bathe here, while just at dusk the banks all round would be covered with sandgrouse. Half a mile further on this water ran into a huge swamp some 2 miles long by 1 wide, covered with dense rushes 10 feet high. In this place we located the only herd of buffalo met with until we reached the lower end of Rudolf. We stayed

three days, trying every means which might enable us to shoot a specimen, but without luck. We tried machans at night; we tried walking round the outskirts in bright moonlight, and nearly with success, but just after seeing some feeding at about 2.15 a.m. on December 17, an eclipse of the moon took place, and the darkness spoilt our stalk. A most curious fact about the eclipse was, the shadow started covering the moon from the right top corner; on clearing things were exactly reversed, light first appearing on the left bottom corner, and the last dark spot clearing from the right top. Mr. Whitehouse noticed the same from a place 3 miles distant. We attempted to follow the buffalo on their narrow tracks, up to the waist in awful slime and green mud, the accumulation of centuries, judging by the smell. As a last resource we organized a grand drive, while we took likely stands in main tracks. The expenditure of five hundred blank cartridges and much shouting only resulted in two of our beaters getting tossed, luckily with no serious injury; so we had to leave Bilen beaten, but vowing vengeance against the buffalo should we ever come that way again. Round the swamp we found our first lion-spoor. Building a zereba with our lion donkey tethered outside resulted only in quite the most unpleasant night possible. Oh, the mosquitoes! Their size and avidity for the Anglo-American blood! Several side trips gave us a good idea of the country. About 5 miles north-west we came across the bed of the Hawash river, just across which were three extinct volcanoes. A few miles further we discovered a lake called Lihadu, fed by the Marion river running from Abyssinia, while the outgoing river, the Arthso, is said to join the Hawash some miles further north. The river here was obstructed a good bit by sandbanks, on which were basking numerous crocodiles. A small lake of fresh water we called Kemp lake, numerous small streams from the Dofat valley running into it, though we could find no outlet for its waters.

On December 19 we reached the much-talked-of Hawash river, a fine broad stream of 90 yards in width, deep, with a fast-flowing current; this river is another which is said to run out and disappear some 70 miles further north-east; such a volume of water, one could hardly believe it. Here our Berthon boat became decidedly popular, especially as crocodiles abounded. We found at this camp our first fresh elephant-spoor, and, being keen to procure some ivory to take up as a present to the emperor, we all separated and entered a 3-mile patch of dense African jungle; huge prickly aloes, enormous cactus with long sharp points, and a tall feathery plant like privet, made up a safe asylum from ordinary mortals. Very few minutes sufficed to turn hunters into hunted. No. 1, a cow, charged down on us. Jumping aside, I killed her as she rushed on my shikaree, not 4 feet from him. Hardly had we struck the spoor of another lot, when a young bull suddenly bore down on me; however, a lucky forehead-shot laid him low. While

skinning one of these heads, the whole place seemed alive with elephant crashing towards us. Seizing my rifle, I ran ahead to try and cut off the troop, when suddenly a line of over forty elephant broke cover, about twenty-five in the first line jammed together like a cavalry regiment charging. Being only 20 yards from me when they appeared, with the centre bearing directly down on one, I own to feeling they had the best of me. I saw my only chance was killing a flank one; in a second I dropped the left-hand one, which, falling inwardly, inclined the whole troop a little to the right. Within 10 yards I fired my remaining barrel, dropping another, causing still further deflection to the right; another second the flank one on the left rushed past, almost knocking me down. I felt thankful for such a lucky escape, and blessed my new ·450 cordite rifle by Rigby, which had done such good work, five elephant in six shots unquestionably proving its value. I found, on returning to camp, Whitehouse and Butter had both undergone similar experiences, and I felt bound to apologize for introducing them to their first elephant—such elephant, and in such a jungle! We stayed at the Hawash river camp till Christmas Day, spending Christmas Eve again sleeping out for lion. Early Christmas morning we moved, cutting off a big bend of the river, and as we approached the banks we were a little alarmed to see scores of armed warriors galloping in from all directions. We at once took the precaution to form up and wait for stragglers. In the mean time we found they were only a large party of Gallas hunting; they were fine men, and splendidly mounted, but entirely nude, excepting a few who wore a bit of skin on the shoulders. Having never seen a white man before, they exhibited much astonishment at our boots, thinking they were our feet with only one toe! The river here was 5 feet deep, with a strong current; despite crocodiles, Clarke took his clothes off and swam over. A few hundred yards and we again had to cross the Kassam river, banks 30 feet high and very steep. We decided to camp on the bank at a place called Lamafun, all around being thick bush. From our camp we had a fine view of Mount Assobat due East, while a fine-looking pile to our west obtained the name of Clinton range. We prepared a sumptuous Christmas repast that evening, ending up with plum-pudding carried for the occasion; while a bottle of champagne was taken from the medicine store (no liquor being carried except as medicine), in which the toast of home and absent friends was drunk. Retiring to bed at 10.30, my friends did not love me when at 1.45 a.m. the morning trumpet sounded, but on a long trip the camels must be considered before anything else. A short march brought us once more on to the main track from Harrar to Adis Abbeba, and it seemed funny to suddenly run against a telephone wire, which the emperor has up to the capital from Harrar.

On December 27 we again reached the banks of the Kassam river, the road crossing many deep ravines, but beautifully shaded by large

mimosa and other trees. We halted under some big thorn trees at a place called Tadechamalka, and at once set all hands to work making a large zereba, as we intended giving the camels a well-earned rest while we journeyed up to pay our respects to the emperor. Clarke stayed behind in charge of the camp, glad to have time to go over all his work, and complete his mapping up to date. With about six boys and Mohamed we started for our 100-mile ride, camping at Choba, alt. 4800 feet. At Balge, situated on a high plateau over 2000 feet above the country below, we began to feel the cold terribly, added to which it rained daily. Passing Chaffe Dunsa, and Akaki, alt. 7800 feet, we at last arrived at the capital on January 1, proceeding direct to the English compound, where we were most warmly welcomed by Colonel Harrington, who not only supplied us with numerous tents, but made us his guests for ten days, during which we had a most delightful time. On New Year's Day we all dined with the Italian minister. On January 5 we were received by the emperor, who was most kind, and promised every assistance through his country to Rudolf. We bought five fresh mules, two Abyssinian horses, and a flock of 100 sheep. On Sunday, January 7, being their Christmas Day, the emperor most kindly asked us all to dine in the huge hall called Abderash, a building about 190 feet long, 90 feet wide, and 35 feet high. All the ministers, ras, and principal generals were present on the raised daïs round the throne, while in the body of the hall about 30,000 soldiers were fed in two detachments. Our menu was as follows:—

Milk and rice soup. Kabobs of meat and potatoes. Omelette and herbs.
Mince and artichokes. Fillets of beef and radishes.
Kabobs of mutton and cabbage. Fried brains. Fried mince and maccaroni.
Smoked beef and lettuce. Brown rolls and flat bread. Coffee.
Honey beer. French claret. Arrack. 12-year-old teg and Epernay champagne.

After dinner we shook hands, and, through an interpreter, thanked his Majesty for so much kindness. He replied, "May the Lord keep you well, and may you return safely to your own country. May you have good shooting and a pleasant journey through my country."

On January 9 we all turned out to meet the emperor for a trial hunt with hounds, and also with two horses sent by her Majesty the Queen to the emperor. We were lucky enough to find and kill a jackal, which much pleased his Highness and the thousands who escorted him. The emperor then returned to the English compound, where hospitality was dispensed by Colonel Harrington. On January 10, accompanied by Mr. Baird, we bade our kind host farewell, agreeing we had never spent a more enjoyable ten days. We reached our main camp in three days, and found many boys down with fever. Here we remained four days, packing all our trophies to send back to the coast, getting rid of all useless baggage and cutting our men down to fifty. Mr. Powell Cotton had lately decided to leave the party

and return to Adis and work north after ibex, of which I since hear he obtained three specimens. On January 18 we made another start, passing by more of those wonderful boiling springs. A few miles further on, having left our course to climb some high ranges, we suddenly came on the ruins of a large town and fort called by the natives Hallam, said to have been built about 900 A.D. by the emperor Zarakob, who was defeated by Granya. It is a wonderful place, laid out on the summit of a lofty hill, the walls, 3 feet thick, of loose piled stones, all now levelled to about 3 feet in height. One could still trace all the foundations of the houses, with streets winding in and out. The town covered a space one mile long by half a mile broad. On January 19 we camped at the Mathara lakes. Though not far apart, the large one was quite salt, while the small one, Edith lake, was fresh. We had some terrific climbing in an attempt to get across to a small mountain for survey work. Recent volcanic eruptions had simply strewn the whole country with enormous blocks of lava, while masses of solid rock of all sizes, up to 15 feet square, had been thrown up and scattered thick as hailstones. I cannot imagine a rougher climb in the world, and only two got through, though many started. This march left the fine pile of the Fantali mountains just behind us; for weeks their highest peak had been one of our survey points. A long march next day brought us to the Hawash river again. This country having never been visited by white men, we were again the objects of great interest. Though the valley afforded good grazing, it had very few inhabitants, while the south bank was densely covered with mimosa bush. The whole country abounded with the camel poison tree, which alone entailed endless labour and anxiety.

On leaving Oresa we found the first cultivation—peas, cotton, maize, and barley being grown, while the district was densely populated with Arusi Gallas, occupying large villages called Oresa, Wargi, Korri, and Wagia; but even here drought was beginning to tell its tale. We shot two hippo while camping on the river; and encountered an Abyssinian gentleman, who, having nothing else to sell us, tried to sell his wife. After repeated attempts, he and the good lady, looking crestfallen at not even raising a bid, proceeded on their journey. Our spare time all along this valley was fully occupied with prescribing for every kind of ailment; the chief being bad eyes, for which, unfortunately, we were quite unprepared. We had now for some time a splendid view of that grand mountainous mass called Zakwala, 10,000 feet above sea-level, this and Fantali being of great assistance in our survey work. We passed a small sweet-water lake with no name, but covered with wildfowl, arriving at Gogo near Lake Buffa on January 26. Here we rested our transport for a few days while we made a side trip to ascend Zakwala, some 22 miles distant. Leaving our mules at the foot of the mountain, we began our hard task. At an altitude of 8500 feet we

stopped for lunch, and admired the grand view. Butter and Clarke, both born mountaineers, pressed on to the summit, which had once been an old crater, but now forms a pretty little lake, called by us Butter lake, about three-quarters of a mile in circumference. Rising all round from the water's edge are the sides of the crater, in places 600 feet in height. On the lake dwell a priest and several hermits, while on the eastern slopes are several villages ensconced in crevices of the rocks. The hill is considered holy, and boasts of three churches, one in ruins, while the whole place rings with superstition. For instance, the hermits go daily to pray at a curious chasm in the rocks, the legend recording how in olden days a pious hermit ascending the hill met the devil, whom after a severe struggle he conquered; so, founding a chapel, he settled down there, people coming from far and wide to cure disease by bathing in the lake. The whole country round was under the rule of Fiterauri Apta Mariam, who has the right to administer justice for all offences excepting murder, which rests with the emperor. As usual, the women do most of the work, weaving a great deal of the cheap calico, threshing out corn with curious flails, while in places they carry all the water on their heads for miles.

At Gogo we said good-bye to Baird, from whom we much regretted parting, for a more cheery companion or better sportsman it would be hard to find. We found sickness rife in camp, twelve boys being bad with fever. It is wonderful how food and no work plays havoc with a whole caravan. On February 1 our boys were all looking out anxiously for the new moon, which heralded their Christmas Day (making the third we had kept) and ended Ramadam, their month of fasting. We got fine views of Mount Sitala to the south, also the smaller peak Arbora. We camped at Gafartha, in the middle of the Bugra plain, covered with wretched grass and half-dead bush—no water. A side trip of a few miles brought us to three small fresh-water lakes, which we christened Queenie, Gladys, and York lakes. Another 12 miles took us across the river Maki, which feeds Lake Zwai. The grass round here had been lately burnt, making us terribly black and dirty. Next day we reached the shores of Lake Zwai, 5400 feet—a fine sheet of water about 25 miles long, full of hippo and wild-fowl. Here we had very bad luck, our camels having the previous day got to the gumbot tree. By this we were delayed a week, during which we were kept in terrible suspense. All the camels were affected, several went mad, others were unable to get up, and it really looked a hopeless case, for we had no chance of replacing them. We promptly killed two sheep, and with boiled durra drenched them twice a day with strong soup; we also tried firing them. We lost a pony here from horse-sickness. Luckily, our camp was among countless herds of game—hartebeest, Grant's and reed bucks chiefly—so we had no need to consume our stores. The natives belong to the Waiyu tribe of the

Arusi Galla—a good-looking lot of people, especially the women; one sees among them good noses, no thick lips, but good features altogether. The men wear clothing, armlets of ivory or copper, necklace of beads, and feathers in the hair; they are armed with clumsy ill-fashioned spears, also a huge chopper-like knife with a round end rather like an Indian cookie. Terrific thunderstorms visited us night and day. We were lucky in being able to purchase twenty-five really good donkeys; so on February 10, finding forty-nine camels better, though very weak, we again moved on. I estimate that, through our boys' carelessness, the poison cost us twenty good camels—a serious loss. To the west Mount Gobeha stood out, a notable landmark above the dense bush and forest covering all this country. Most of the inhabitants had never seen a camel; imagine their fear and astonishment, while their ponies and mules simply went mad and bolted. We next passed Lake Horai, to the east of which lies Lake Seveta; during the rains both join and form one large water. The river Suksuk joins Zwai and Horai. Another river joins Horai and Lamina, while Mount Alga divides the two waters. A curious thing was that the lake-water, of a pretty green colour, though quite sweet, refused to be forced through our filters; close by the Gidu falls the water was brick-red. The Tuka Gallas are all great hunting people, hardly doing anything else; they inhabit the western shore of Horai.

Travelling along the foot of the Kambata range, we crossed many running streams, and a country densely populated, the chief tribes being Adarri, Waragi, and Gurage; all seemed well-to-do Galla. We had now to leave the low country and face the steep hills of Ulamo. After two days' incessant climbing up and down ravines, we emerged on the fertile hill on which the chief village of Ulamo is situated. How pretty all the country looked on these hillsides, green with young grass and many kinds of timber; hundreds of kraals, each in its own little plot, surrounded by banana and palm trees; while cotton, limes, ginger, and a vegetable called "godaris" grew in profusion! The mountain-sides to the topmost peaks were cultivated, the bright red patches of soil glistening in the sunshine. Many sorts of lilies and other flowers, besides innumerable gay-plumaged birds, met our view on every side. Market-places abounded—every two miles—and thousands of natives collected daily at each. We camped near Mount Dalbu, 6700 feet, the mountain itself towering to a height of 10,400 feet. To the west stood out a fine range of hills with three peaks, which we called Brandesburton range; while further south an unnamed mass of hills was called Whitehouse range, a continuation of which, a mass of mountain much broken up with deep ravines, was christened York range, with a notably high peak, James peak. We here found quite a new currency—thin bands of iron 2 feet long, 1 inch wide, sixteen of which go to the Abyssinian dollar; they are called "dorma." The shum being absent, his headman

brought us abundance of presents, which, of course, we returned by other gifts. Next day, February 22, we got our first view of Lake Margherita. I forgot to mention at Ulamo (which, according to Captain Wellby, is "devil-haunted") we tempted Providence by taking all our meals in the presence of hundreds of spectators, but with no ill effect. The legend runs that any one seen eating by Ulamo people goes mad; what we were nearly prevented from doing, was eating at all, owing to the countless swarms of bees which invaded our table.

We next traversed the district of Baroda. Rain every day made the roads almost impassable; climbing up and down mountains 5000 feet in a march almost broke one's heart, and several camels sank down to rise no more. At Baroda a priest and his acolytes joined us, and, clad in their vestments with coloured umbrellas, accompanied us on a 7-mile march; singing and chanting, they refused to be shaken off till we halted and unpacked the dollars! On February 27, after terrible hillwork, besides a couple of miles of road over swamp, we were met by Fiterauri Doris's headman, accompanied by 277 natives bearing presents; these were merely for that night's use! But oh, the cold, despite our roaring bonfires! We were 8900 feet up, in thick fog and rain, quite among the clouds. Next morning half our camels could not get up till we had lighted fires all round them and thawed the poor beasts. But our hill troubles were nearly over for the present, 100 natives coming to carry some of our kit and ease our camels. Next day a deep river, followed by wet and uphill climbing, quite demoralized our caravan. I had gone on ahead, muddy and wet through, and, with only three boys, was dragging along some fifteen weary camels, when, surmounting a hilltop (9400 feet), I suddenly came upon a very pretty picture. Our track lay between two banks, each of which was crowded with people. Fiterauri Doris was there, with all his officers, and 700 soldiers clad in their bright-coloured garments; mounted men were dashing about to keep back the crowds of Gallas, while hundreds of horses and mules with gay trappings were standing about in groups. Of course I had to pull myself together and look my best. After warm greetings, I was led towards a fine mule, possibly a splendid hack when you got on, which I never did. Abyssinian stirrups are 2 inches wide, and what with my shooting-boots, and the mule's kicking and rearing, I never got within 3 feet of the saddle. However, my kind host gave me a more reasonable mount, and the *cortège* proceeded to the site fixed on for our camp. How I longed for my companions to be with me! but unfortunately they were behind. The presents were carried by 531 men, women, and children as follows: 181 grass, 146 firewood, 89 bread, 61 ghee (butter), 15 honey beer, 12 honey, 8 butter, 10 grain for ponies, 6 chickens, 2 cows, 2 camels, and basket of eggs. Our presents in return were a sword, revolver, bottle of kümmel, blankets, razors, and scissors. We were most pleased when our kind host

told us not to load our camels any more among the hills, and sent us about 500 Gallas to act as bearers. During this march we crossed our highest point—just over 10,000 feet, at which level we found, to our surprise, bamboos, blackberries, daisies, tiger-lilies, and trees covered with ferns. It was quite one of our most interesting marches. Arriving at Dincha, our worthy host, Basha Islamani, took us in hand; his presents were 2 cows, 9 sheep, 408 grass, 356 wood, 13 ghee, 7 honey, 153 wine, 97 baskets of bread, 1 grain, 4 curry pepper, 12 chickens, 31 eggs, carried by a grand total of 1093 people. We were again supplied with a fresh relay of porters, one Abyssinian soldier looking after every 10 Galla.

This day's march was more of a slide than anything else, for in less than 7 miles we climbed down 3888 feet; for this porterage we had 800 Galla men. We camped once more on the flat shores of Lake Margherita, or, as the natives call it, Aballa, and at the south end Nai Chaba. A short march brought us to a pretty sheet of water 20 miles in length called by the natives Abaya, and by the Abyssinians Degurabe. We found here a small village, the huts of which are built either on lofty poles in the lake or in the trees on the edge; they are a poor feeble-looking race, living entirely on fish. While camping here we heard of elephant in the dense jungle-grass; we all went off in a body, and, after much walking and continual climbing of ant-heaps, we located a troop of about twenty feeding towards us. To watch them ten of us crowded on top of one small ant-heap, each holding on to another. We kept quiet, and the wind being right, the troop gradually fed to within 40 yards of us, when, getting our wind and scenting danger, they ranged up in line, with trunks waving, and seven baby elephants close to their mothers' heels. Things began to look unpleasant, so I was deputed to try and scare them. Picking out the largest bull, I dropped him dead with a shot in the brain; this caused the rest to stampede, and released us from what might have been a most awkward and dangerous position had the cows once placed us. However, it was a sight well worth seeing, and one never to be forgotten; but how we cursed our luck to find all our cameras back with the ponies! At Gardula we camped in the middle of terraced gardens, all the hillside being levelled up by thousands of low stone walls; none of the plots are more than 6 feet wide, and yet hundreds of miles are treated in this manner. Here we were courteously entertained by Fiterauri Waldo, who now represents the last Abyssinian outpost; owing to the fearful drought, the more advanced posts at Hammer Koki and on the Omo have all been forced to retire. This officer has 1500 soldiers under his command, who spend all their time killing elephants for the emperor; he told us they alone had sent 1500 tusks to Adis in the last two months, which possibly accounts for the few we found. March 10 to 12 we camped at Godigea, on the river Manta. Here some high hills were called Beverley range, and a particular lofty pile Mount Clarke,

which our keen surveyor climbed; while due west of Gorso, far down in the big valley which forms the watershed towards Lake Stefanie, we named a pile of mountains Faskally. After traversing the whole district from Gogo and Buffa lake to our present camp, we came to the conclusion that the entire country was once a vast sheet of water, connecting the whole chain of lakes with an outlet at the gorge south-west of Godigea. This part of the valley has formerly been all cultivated in cotton-fields, but it is now neglected and devoid of population. We found our first rhino here, Butter killing one and Whitehouse another; the latter, unfortunately, getting his shikaree, Darod Nur, badly smashed up before he killed it. Having set a broken leg and dressed the other wounds, we sent him back to our kind friend, Fiterauri Waldo, who nursed him till well enough to send down to the coast.

While waiting, parties of men had tried to find a road for camels to the west. It seemed quite hopeless till at last we discovered the bed of a small rocky stream. Even in this, the rocks twice narrowed to only 3 feet apart, so we had to unload and blindfold all the camels before they would pass through these narrow chasms. The next few days disclosed terrible sights. All along, lately, we had seen single skeletons on our route, but now huge villages, such as Gorso and Dalbana with many others, could not boast of two living people in each. We passed hour after hour through silent cities of the dead, counting six to eight corpses laid together, while inside the kraals you could see the whole family just as they had perished, the last having crawled and dropped almost on the embers of the fire. The few people living were crawling about, eating the young shoots of a certain weed and digging up grass roots. The fearful stories we had heard at Adis Abbeba came back to us, and from what we could gather things ahead looked bad; still, though several times hard pushed for water, so far, among the hills, we had suffered from too much rather than too little. March 15 and 16 still found us travelling through similar sad scenes. We named our last camp in the hills "Desolation," and close to it we suffered a serious loss through one of our best camels, which had carried unchanged from Zeila 280 lbs. of rice, falling over a steep precipice while on the march. Falling some 90 feet sheer down, and then rebounding another 50 feet, the poor beast's remains were found fast wedged between two rocks. Our last big climb (6600 feet) we did this march, coming out on the bed of the Galana Sagan river (2700 feet) on March 16. You cannot imagine what getting on to level ground once more meant to us. As we looked back on those lofty mountain ranges, through which we had had to cut our way for three days in dense scrub, we thought of the five weeks spent climbing up and down thousands of feet almost daily, and wondered we had a camel left alive.

We now found ourselves in a valley about 6 miles wide, the Hammer Koki range opposite. This valley used to be the home of huge

elephants, but, alas! they are about a thing of the past, cleared out by the constant shooting of Abyssinian soldiers, who are now following the ivory right through the Boran country. I procured one big fellow here; unluckily he only had one tusk, 94 lbs. in weight when fresh cut out. Here we found existing maps in great error. The big Galana Sagan is shown as running into the Dulei river, whereas it really runs into the valley, and then, spreading out, disappears in all directions, as we found to our cost. The river joining the Dulei further south, and said to be the Sagan, is a different stream rising close by among the mountains on the east, which I called after myself—Harrison range. All these streams were quite dry, though during heavy thunderstorms the whole country was a running sheet of water 6 to 12 inches deep. We had terrible work, our whole caravan being one night and day penned up on two small antheaps. For three days we were stuck fast, losing three or four camels when trying to move only a mile. Following the valley south, we kept a sharp look-out for Lake Donaldson, but found later on we had traversed the whole length of it unknown, all being covered with bush. We concluded that during very rainy seasons a great deal of the land was flooded, but as a lake it was quite undefinable. We now saw ahead, as far as the eye could reach, nothing but a vast extent of ground strewn with shells and heaps of fish-bones. "Stephanie—dry!" we all said; and a thunderbolt in our midst could not have caused more consternation. The sieves had all been burnt, and most of the roots dug up. We afterwards found about two hundred Boran people still living here. They dug up these sieve roots and ground them up, eating them instead of meal. To us it looked like sawdust. We ascertained that the last of Lake Stefanie had dried up about Christmas. We camped near some deep holes dug out to drain the last of the water, but now containing 18 inches of water from the late rains. Terrible was the result of drinking this, for next morning only ten boys were able to move; over forty lay suffering agonies. Luckily, we had used our barrels of rain-water. A move was bound to be made, but half the day had passed before we were loaded up, and then commenced a weary hot march due east for the mountains.

On first reaching the lake we spied some natives, and after an exciting chase two were led in unwilling prisoners; but what a change came over them on finding we were English, and not their dreaded Abyssinian neighbours! They at once guided us to the water-holes, and then went to summon their headmen. From these we learned that most of the inhabitants had died, others having gone up north to the Omo. The worst news was still to come, for on asking if there was good water in Lake Rudolf, they replied there was water, but any one drinking from it died. This seemed a confirmation of all the worst rumours yet heard. Personally, I still felt convinced that a sheet of water over 200 miles long could not be so quickly rendered unfit for

drinking. Still, it was a cause for much serious reflection. So far, owing to the daily thunderstorms, which the oldest inhabitants said they had never before known to occur at that time of the year, we had reached Stefanie; without them we could certainly not retrace our steps, though we now knew the country; while if they gave out and Rudolf was poisonous! Well, neither happened. On the fourth day we camped on Lake Rudolf, according to our marching distances 45 miles from Stefanie. For the present our maps are not completed further, owing to an error of the chronometer, a thing no one can guard against; the remaining 600 miles of valuable work to Rudolf, and then down its East coast *viâ* Lake Baringo to Uganda, has to wait till another fixed and corresponding observation (shortly expected to be made) can be obtained, when the rest of the work done will be adjusted in accordance. A curious incident happened here. Mahomed had often told us of a pure white topi he and Captain Wellby had seen and tried to shoot. Sure enough, as we were pitching camp in a heavy storm of rain, our white friend was feeding a mile away among thousands of the ordinary topi. Knowing it to be almost hopeless, I still went out, and at once the whole drove started moving. An hour later Butter came in in great excitement, saying he had shot the white topi. It appears his shikaree had noticed it, and, getting behind an antheap, he was lucky enough to drop it with a very long shot with his mauser as the troop streamed past—splendid luck!

My first act on camping was to send off two camels for water, as the nearer I got to the lake, the greater my anxiety became. I felt ten years younger when the word was passed up, "Water good." On March 31 we left camp early and rode up to visit the Omo at Murle, having decided, if this big river was dry, to work out south by the lake to the Uganda railway. All the thick scrub and timber which should have been alive with elephant, was almost dead, with never a sign of living beast or bird. Passing deserted villages, we came on to the banks of the Omo, and with sad hearts ate our lunch in the middle of the dry stream, while our mules fed on the green luxuriant grass, which had completely covered the whole dried-up bed, till it looked more like some green glade in a forest than the important Omo river. Having scouted round the whole country-side in hopes of finding some natives, we returned, and with difficulty selected a single tall thorn tree near Murle. Sending our shikarees up with axe and saw, we dressed all away, leaving only a centre arm, on which we hoisted the English flag; doing so at the request of Colonel Harrington and with the acquiescence of the emperor, to denote the Abyssinian and English boundary-line. Had we been able to discover any inhabitants, we should have hoisted a second flag further north. Needless to say, as the flag went up the whole party sang "God save the Queen," a bottle of champagne having been brought along in which

to drink her Majesty's health. On carefully examining Rudolf, we found its level had sunk 12 feet during the last year, while in what appeared as three stages (no doubt years) the lake had lost 28 feet. Naturally this had dried vast tracts of country, many of which we tried to cross, but found it hopeless, owing to elephant spoor 18 inches deep, now hard baked and grassed over, forming death-traps to our camels. Enormous herds of game, including topi, zebra, oryx, and Grant's gazelle, covered the hard-baked, flat, dreary-looking country which borders the whole lake on the east side, while rhino were a positive nuisance; of buffalo we only once saw five, halfway down the lake; giraffe were seen at the north end, and again below the south end. Lions seemed plentiful by the spoor all along, but we could not afford to give up time and wait for them. The heat was terrific, and Clarke was unfortunately taken seriously ill with fever, which laid him up for some days. We had several excitements on our march along the lake. A lioness I had crippled suddenly charged down on us while photographing her with a binocular 12 yards off. We all jumped different ways, and she just missed my boy, but caught my best cordite rifle, breaking one trigger off and discharging both barrels. I luckily finished her before further mischief was done. Then four rhino came down to drink at pools close by our camp. They charged among our cows, donkeys, and goats, stampeding the lot. Another day, which nearly proved to all of us our last, we met our last lot of elephant, in dense bush. A cow with baby calf, the worst I ever met, simply hunted the lot of us. Butter and Mohamed hardly know how she did miss them; Whitehouse and his shikaree plunged under a thick bush; while she tossed his second shikaree over a 10-foot bush, and put her foot on Whitehouse's hat and glasses close to where they had scrambled. Then, as to myself, after dodging her twice by a few inches only, I shot her 7 yards off as she charged a third time. We then returned to finish our lunch, agreeing we had all had enough "being hunted" by elephant for one day.

On April 6 we buried the only boy lost on the whole trip. Five starved Galla had joined us six weeks before, asking to work for food, and capital fellows they turned out. This poor fellow got fever badly, and, after being out of his mind fifteen hours, died, so we covered him over with brushwood, and heaped stones above. We had a heavy roll of sick men all along the lake; it took all our extra mules, donkeys, and ponies to get them along, crossing endless dry river-beds, which in the rains must carry an enormous bulk of water down into the lake. Our whole journey was in sight of the lake, excepting April 10 to 13, when we passed east of the mountains, the streams still running into the lake. On the 14th we came to a small fishing village, Burkeneji, and, seeing figures moving about, hoped to have speech with them, but before we arrived they had embarked all their chattels

on board five dugouts, and stood out to sea! Two days more brought us opposite a huge mountain called Kulab. We stayed here a day so that my companions might go and hunt for big koodoo; Butter had fine luck, bringing back a perfect beauty, horns 52⅛ inches. I in the mean time had been prospecting our road ahead. Next day my mule, "Oom Paul," quite eclipsed its former achievements by galloping away down a rocky precipice, over which we both got a toss. I was at the time snapping a photo of the lake with my binocular, which the fall smashed in two—bad luck, as it fogged and spoilt the plates on which I had taken the lioness charging. On April 19, when abreast of Teleki's volcano, we bade farewell to that vast sheet of water, not without a certain regret, I own; at this point we struck Lord Delamere's old track, and by what we had done I could realize the task he had performed. Of course, much rock-moving had to be done, but we had the line of the road, which was a great help. On reaching Mount Nyirobuk, we encountered the Boma and a tribe called Lokuba. Clothing was quite dispensed with; slitting the ear, they insert a large round piece of wood, or some swells prefer four brass cartridge-cases. Hair-dressing is practised in many styles, some having it down to their waist, but small curls smeared and plastered down with a red brick-dust looked best. They wear iron armlets and beads, live by hunting, and use bows and poisoned arrows, with long spears. The next tribe, called Semirides, own large flocks of sheep and cattle. They are a well-built and good-looking race.

Passing through the Narrow valley, which contains splendid grass, but few inhabitants, we again got some heavy hill work—April 29, 7250 feet; April 30, 8400 feet—and began to have heavy rains, which made us anxious to push along. On May 3 we travelled across what years ago had been a huge lake running right up to the foot of the range of mountains to the east. On May 6 we saw the lofty peaks of Mount Kenia, some 90 miles distant, glistening in the sunshine. On the following day we had a lovely view of Lake Baringo stretched below us, and a steep climb we had getting down, then several deep and swampy rivers intervened before we brought up at a large prosperous village, called Nyems, 3300 feet. We found here a Swahili trader, who volunteered as guide to Naivasha. On May 11 I killed my last rhino, and the same afternoon we camped at Elmolo, on the main road from Uganda to Mombasa, and what a luxury it was to travel once more on a well-kept road, with decent bridges and a telephone wire! At this point Clarke gave up any further surveying work, the rest being well known. On May 13 we reached Lake Naivasha, where several English people connected with the railway kindly entertained us. Pushing on, we reached Railhead on May 15, having done 103 miles from Lake Baringo in four and a half days—a fine performance, after our camels had done 1453 miles at an average of 11½ a day. I consider we had wonderful

luck with our animals; for owing to the enormous amount of rice we carried for the boys, they were heavily loaded. Our losses were thirty camels, two-thirds being entirely due to the poisoning episode; one pony, from horse-sickness; one pony and one mule ran away and got lost; one donkey eaten by lion, and one shot, being lame. We sold all our live stock at Railhead, the railway buying the mules, while Indian traders took our camels. It was with great regret we said good-bye to those best and most long-suffering of animals, which had shared our ups and downs through so many months—one camel having carried a 280-lb. load of rice through from Zeila without a break, which our boys said, was an unheard-of performance. Knowing the difficulties we met with on account of rains, the awful mountain ranges to cross, the never-ending fear of poison, want of any feed the first two months, with the endless marching, and last, but by no means least, sore backs, one can only say it was almost a miracle to get through. We quite expected to be able to replenish our transport both among the Borana people north of Rudolf, or, if south, from the Rendili; but, alas! all these supplies had vanished.

I cannot close this paper without once more calling attention to the splendid work done by our Surveyor, Donald Clarke; no day was long enough for him, and no mountain too high to be climbed, after ever such a long weary march and in the heat of the day. One feature we particularly admired was, he never would insert a yard of country unless seen by himself or vouched for by one of us. When in camp his kind cheery manner endeared him to all, while his skill in doctoring was only equalled by his skill in the cooking line. It is owing to his absence on the West Coast of Africa that the error of the chronometer, before mentioned, cannot be rectified in time to publish the portion of his work beyond Lake Rudolf.

Taking the first train, we duly reached Mombasa, where we shipped all our boys direct to Aden, we ourselves having, on account of the plague at Aden, to go home *viâ* India, a month's longer journey. Excepting Clarke, none of us had a day's illness; but on the steamer, when close to India, we all had a touch of fever.

THE NATIONAL ANTARCTIC EXPEDITION.

The sailing of the *Discovery* from Cowes on August 6 marks the successful close of the first stage in the great undertaking which has more or less occupied the minds of geographers in this country for the past eight years. Since November, 1893, the supporters of the proposal for the renewal of antarctic exploration, among whom our President, Sir Clements Markham, has from first to last been the moving spirit, have

been untiring in their efforts to secure the despatch from our shores of an expedition fully equipped for the execution of the important scientific work offered to investigators by the unknown region surrounding the south pole. In spite of much difficulty and discouragement, those efforts have now been crowned with success, so far as the work of preparation is concerned, by the despatch of the best-equipped expedition which has ever left this country for purposes of antarctic research. Much remains to be done by those at home to ensure the continued support of the expedition from its base of operations in this country, but it is to the intelligent and zealous commander and his capable staff of officers and civilians that we must now look, in the confident expectation that all that brave and determined men can do to make the undertaking a success, will in any case be done.

The *Discovery*, which since her arrival from Dundee had been lying in the East India Dock, cast off her moorings at 1 p.m. on Wednesday, July 31, and after being turned in the dock by the tug, proceeded down the Thames under steam, *en route* for Spithead, from which the final start was to be made. On board, in addition to the officers, scientific staff, and crew, were Sir Clements and Lady Markham, Sir George Goldie, and other representatives of the Royal Geographical Society, as well as a limited number of scientific men and others, who thus testified their interest in the undertaking, and their cordial wishes for its success. During the passage down the river the expedition received an enthusiastic send-off from the various craft in the river, as well as from groups of onlookers from the banks, who had assembled to bid a final adieu to the ship. Greetings were sent from all sides by means of signals, steam-whistles, etc., and were returned by the dipping of the blue ensign, which the vessel was flying. At Greenhithe, which was reached at 3 p.m., boats were in readiness to take on shore the visitors, the *Discovery* then holding on her course with her own complement, minus one or two members of the staff who joined the ship subsequently. Sir Clements Markham remained on board and made the voyage to Spithead, where the King was to inspect the ship before the final sailing.

On Monday, August 5, the *Discovery* proceeded at 9 a.m. from Stokes Bay to Cowes, and at 11.30 the King came on board from the *Osborne*, accompanied by the Queen and the Princess Victoria. Their Majesties were received by Sir Clements Markham, and Mr. Longstaff and Captain Scott were presented. Sir Leopold McClintock and Sir Allen Young were also in attendance. Their Majesties addressed a few gracious words to Mr. Longstaff, and the King then received the officers and civilian staff, who were presented by Captain Scott. The men were inspected, and the royal party went round the upper deck and the living deck, showing great interest in all the arrangements. Before leaving the ship, the king, who was in the uniform of an admiral of the fleet, addressed the officers and men to the following effect:—

"Captain Scott, officers, and men of the *Discovery*,—I have had great pleasure in visiting this ship with the Queen, because of the interest I take in the Antarctic Expedition and its objects, and in order to wish you all God speed. You are going on a service from which, I believe, great results will accrue. I have often visited ships in order to say farewell when departing on warlike service; but you are starting on a mission of peace, and for the advance of knowledge. The results of your labours will be valuable not only to your country, but to the whole civilized world. I trust that you will be able to achieve the great work that is before you, and that you will all return safe and well."

Before leaving the ship, the King decorated Captain Scott with the Victorian Order; and on shoving off, their Majesties received three hearty cheers from the officers and men of the *Discovery*. The explorers left Cowes on their adventurous voyage at noon on the 6th.

It is unnecessary to add anything to the statements as to the programme and aims of the expedition, which have already appeared in the *Journal*. We give below a complete list of the officers, scientific staff, and crew, making up in all a complement of fifty souls. Of these four are naval officers, four (including Mr. George Murray, who goes as far as Melbourne) scientific civilians, two officers of the R.N.R., two surgeons, twenty-four naval seamen, two royal marines, and seven merchant seamen. It will be seen that the scientific staff has been completed by the appointment of Mr. Louis Bernacchi as physicist, and Mr. H. J. Ferrer as geologist. Mr. Bernacchi will proceed direct to Melbourne in September, and there join the *Discovery*, a free passage having been generously granted him by the directors of the Orient line. His excellent work in connection with meteorology and magnetism while serving with Mr. Borchgrevink in the Antarctic are well known to our readers, while the work in the way of geological research already performed by Mr. Ferrer, a young Cambridge graduate, gives promise of valuable results from his new labours in this direction. Mr. Murray has also secured the co-operation, although but for a time, of Dr. H. R. Mill, our late librarian, who will proceed with the ship as far as Madeira, and superintend the inauguration of work in the direction of oceanographical and chemical research. It is only to be regretted that Dr. Mill's engagements have not permitted him to accompany the ship as far as Melbourne, for his acknowledged position as an authority on all matters connected with oceanography and meteorology would have guaranteed the acquisition of valuable results for science.

The crew has been selected with much care. All, both officers and men, are young and vigorous, with the necessary reserve of good spirits to enable them to withstand the depressing influences of the antarctic winter. Special care has been taken to supply sufficient resources in the way of recreation, and a library of about a thousand volumes has been got together, largely through the liberality of various firms of publishers.

The programme for the voyage of the *Discovery* to the Antarctic is as follows: After touching at Madeira, the ship will proceed to the Cape, which may be reached about September 12. In another month, or somewhat over, the vessel should arrive at Melbourne, afterwards proceeding to Lyttelton, N.Z., where the final start for the scene of operations will probably be made about the middle of December, so that the opening of the new year should see the expedition well advanced among the antarctic ice. As has been already stated in the *Journal*, it is considered of the greatest importance that a relief ship should be ready to start, if need be, in about a year's time, for the purpose of opening communications with the expedition, and replenishing the supply of coal and other stores. Funds are still urgently needed for this object, which is one that should commend itself to all interested in the welfare of the absent explorers, and the upholding of the worthy traditions of the nation in the matter of useful enterprise. The unremitting efforts of those who remain at home are therefore still needed if ultimate success is to be attained.

LIST OF THE OFFICERS, CIVILIAN STAFF, AND SHIP'S COMPANY OF THE "DISCOVERY."

1. *Commander*—Commander Robert F. Scott, R.N., M.V.O., F.R.G.S.
2. *Second in command and navigator*—Lieut. Albert B. Armitage, R.N.R.
3. *First executive*—Lieut. Charles W. Rawson Royds, R.N., F.R.G.S.
4. *Second* „ Lieut. Michael Barne, R.N.
5. *Third* „ Lieut. Ernest Shackleton, R.N.R., F.R.G.S., F.R.A.S.
6. *Engineer*—Mr. Reginald Skelton, R.N.
7. *Surgeon*—Dr. Reginald Koettlitz.
8. *Assistant surgeon*—Dr. Edward Wilson, M.B.

Civilian staff.

9. Mr. George Murray, D.SC., F.R.S. (*director*), as far as Melbourne.
10. Mr. J. V. Hodgson (*biologist*).
11. Mr. Louis C. Bernacchi, F.R.G.S. (*physicist*).
12. Mr. H. T. Ferrer (*geologist*).

Warrant officers (naval).

13. Mr. E. Delbridge (*assistant engineer*).
14. Mr. T. A. Feather (*boatswain*).
15. Mr. Fredk. E. Dailey (*carpenter*).
16. Mr. Edward Else (*ship's steward*).

17. *Chief petty officer*—S. Roper (*cook*).

Petty officers (naval).

18. Edgar Evans.
19. David S. Allen.
20. William Smyth.
21. David Cross.
22. Wm. Macfarlane.
23. Thomas Kennan.

Leading stokers.

24. Arthur E. Quartly.
25. J. Whitfield.
26. W. Laskly.
27. William Page.

28. *Stoker artificer*—William Hubert.

Domestics.

29. Charles R. Ford (*wardroom steward and assistant*).
30. Charles Clarke (*cook's mate and laboratory assistant*).
31. Job Clarke (*wardroom servant*).
32. Gilbert Scott, R.M. (*marine*).
33. Arthur H. Blissitt, R.M. (*marine*).
34. Albert C. Dowsett (*domestic*).

Naval seamen.

35. William L. Heald.
36. Arthur Pilbeam.
37. James W. Dell.
38. John W. Waterman.
39. Frank Wilde.
40. Henry J. Baker.
41. William Peters.
42. J. Williamson.
43. Charles F. Bonner.
44. George B. Croucher.

Merchant seamen.

45. F. Duncan (*shipwright*).
46. H. Meller (*sailmaker*).
47. J. Walker.
48. J. Marsden.
49. J. Masterton.

50. *Dogs' attendant*—Weller.

THE GERMAN ANTARCTIC EXPEDITION.

By Dr. ERICH VON DRYGALSKI.

THE object of the expedition is the scientific exploration of the south polar region, and more especially its Indo-Atlantic section. To effect this purpose, the expedition will first of all establish a base of operations at Three Island harbour, on Royal sound, in the Kerguelen group, and then push southwards as far as may seem expedient in the conditions that may arise, as well as after duly weighing all the circumstances coming under consideration. Should land be reached while advancing south, every effort will be made to establish, and, if at all practical, maintain for the period of a year, a station where the vessel may winter.

The departure will be so timed and arranged as to make it possible to choose the most favourable season for the main object of the expedition, which is to penetrate into the south polar region, and there found a station. Hence the expedition proposes, after establishing its base at the Kerguelens, to leave that group in the course of December, 1901. Subservient to this general plan will be visits to ports on the outward voyage, and the utilization of opportunities for research along the route.

The homeward voyage will be begun as soon as the objects of the expedition have been attained in a satisfactory manner. The programme does not exclude a continuation of the voyage for further research within the south polar region after the abandonment of the

station established in those waters. It can, however, be undertaken only if the condition of the ship, of its personnel and equipment may seem absolutely to justify a further advance, and provided also that assurance can be had of an unimpaired reserve of provisions and coal sufficient for the prosecution of such a voyage. The month of June, 1904, is fixed as the latest date for the return to some seaport in communication with Germany, and this date is to be observed irrespective of the consideration whether or how far the aims of the expedition have been secured. The homeward voyage is to be by the shortest possible route, but is at the same time to be utilized to the utmost for research work. Should no tidings of the expedition come to hand before June 1, 1904, the equipment of a relief ship in Germany will be considered.

For carrying out the enterprise, the south polar ship *Gauss*, with all its personnel and material resources, will be placed unreservedly under the control of the leader of the expedition, Prof. Dr. Erich von Drygalski, of Berlin, with due regard to the preservation of life and of the ship. Under this right of control are included all hiring of hands and purchase of supplies which, after the departure of the expedition, may be found necessary for attaining its object, always within its prescribed limits and available funds. This right of control extends also to all those incidental operations which, besides the south polar vessel itself and its full equipment, have been already anticipated and provided for.

The personnel of the expedition comprises, besides the leader, who has been appointed by His Majesty the Emperor, and is to carry out the oceanographic and geodetic work—

(*a*) The scientific members: Prof. Dr. E. Vanhoofen, of Kiel, for zoology and botany; Dr. H. Gazert, of Munich, doctor and bacteriologist; Dr. E. Philippi, of Breslau, for geology and chemistry; Dr. F. Bidlingmaier, of Lauffen, for terrestrial magnetism and meteorology. (*b*) The commander of the *Gauss*, Hans Ruser, of Hamburg, a captain in the Hamburg-American line, appointed with the approval of His Majesty the Emperor. (*c*) The ship's officers: W. Lerche, of Stettin, first officer, R. Vahsel, of Hanover, second officer, both of the Hamburg-American line; L. Ott, of Höchst, third officer; A. Stehr, of Hamburg, chief engineer. (*d*) The crew of the *Gauss*, including two assistant engineers, two carpenters, two boatswains, one Norwegian whaler as ice-pilot, one cook, one steward, six sailors, and five smiths or locksmiths, who have served on sailing-vessels, and are to act as stokers—altogether twenty hands. (*e*) The personnel appointed to the Kerguelen station, comprising: Dr. E. Werth, of Münster, as biologist; Dr. K. Luyken, of Düsseldorf, for terrestrial magnetism and meteorology; Dr. Engensperger, of Munich, as meteorologist; and two sailors.

The south polar ship *Gauss* sails under the imperial flag, and both

officers and crew accordingly wear special badges awarded for distinguished services by the highest local authorities. The whole expedition is an undertaking on the part of the German Empire, emanating from the State Secretary of the Interior, Count von Posadowsky-Wehner. The relations of the crew to the captain of the ship are determined in accordance with the provisions of the Act with regard to seamen. Private subscriptions to the small amount (relatively to the total cost of the undertaking) of 40,000 marks (£2000) have also been contributed for its equipment. But the great sympathy which the expedition has met with in all parts of the empire has further shown itself in numerous gifts and offerings, all of which have been of special value for the outfit of the expedition.

All members of the expedition receive from the imperial revenue the salaries which have been granted to them and made known elsewhere. They are also fully assured against accident and disablement resulting from the climatic conditions. Cases not covered by the Marine Accidental Assurance Act are met by supplementary assurances undertaken by the empire.

The results of the expedition, and the collections that may be obtained by it, are the property of the empire, which provides for their disposal. The scientific members of the expedition will share to the utmost in the elaboration and publication of the results, as well as in the distribution of the collections, and this in proportion to their effective co-operation during the expedition. In this connection their completed memoirs and wishes are to be addressed to the leader of the expedition, who undertakes all further arrangements.

The Kerguelen station is primarily and mainly intended for magnetic and meteorological observations, which, like the same work on the part of the German main expedition, are to be carried out in accordance with the international programme agreed upon with England. This programme has been communicated to all those states which possess magnetic and meteorological stations, as well as to the stations themselves, with a request for co-operation towards the end in view. Numerous stations have already given promise of such co-operation, which has also been undertaken by the station which has been planned by the Argentine Republic for Staten island. Concerted action with the British expedition, as well as with any others that may be despatched by other states, has been arranged for, as far as possible, by the distribution of labour in all other branches of science. In all its fields of research the German expedition is committed in matters of detail to no rigid programme, but is empowered to carry out all such operations as may on the spot be found desirable and feasible, and for which the thoroughness of its scientific and practical outfit renders it fully prepared. The problems connected with the south polar region, and the equipment required for their solution, have already been fully

discussed by the leader of the German expedition at the International Geographical Congress held at Berlin in 1899.

THE ITALIAN ARCTIC EXPEDITION, 1899–1900.*

THE closing years of the century were marked by the entrance of Italy into the field of polar exploration, and by the final determination of the limits of Franz Josef Land. Discovered by Payer and Weyprecht in 1873, its southern shores were visited in 1880 and 1881 by Leigh Smith in the *Eira*, and its north-western islands explored by the Jackson-Harmsworth expedition, 1894–97, during which time Nansen passed through the archipelago on his way home. The eastern extension of Franz Josef Land was discovered by the Wellman expedition, in 1898–99, when Mr. Baldwin made a sledge journey to Graham Bell Land, north-east of Wilczek Land, and crossed to its eastern shore. All that then remained to be done was to fix the northern limits of the archipelago, and to search for the King Oscar Land and Petermann Land of Payer, the existence of which had been rendered very doubtful by the observations of Nansen as he travelled southwards to the east of their supposed position.

This was accomplished by the expedition led by the Duke of the Abruzzi, who in July 1899 reached Cape Flora on board the *Stella Polare*. As far as Eaton island, where the *Capella*, having on board Mr. Wellman and his companions, was met on August 6, navigation was rendered difficult by the ice, because the route led through Nightingale sound, but thence northwards the British Channel was quite free of ice on the eastern side, and the *Stella Polare* made a rapid passage up to lat. 82° 4′, when the fog cleared away, and Prince Rudolf island was discovered to the south-east. Northwards the sea was still open for some distance, but as no land was visible in that direction further advance seemed useless; so, after reconnoitring the coast of Prince Rudolf island for a short distance towards the east, the expedition returned to the west coast of the island, and established its winter quarters in Teplitz bay, in lat. 81° 47′ N.

In the early days of September the Duke of the Abruzzi travelled with one sledge round the island past Cape Fligely to Cape Rath. Cape Fligely, which lies, not beyond the 82nd parallel, but only in lat. 81° 51′, proved to be the northern extremity of the island, and thence the coast trends in a southerly direction to Cape Rath. Nansen's Hvidtland was clearly seen from Cape Fligely, each island being recognized, while of

* Abstract of papers by H.R.H. the Duke of the Abruzzi and Captain Cagni in the *Bolletino* of the Italian Geographical Society; revised for the *Journal* by the Duke of the Abruzzi.

the islands marked by Mr. Wellman on his map between Hvidtland and Prince Rudolf island not the slightest appearance was ever noticed, though the Duke spent thirty days at Cape Fligely. In the map in the *National Geographic Magazine*, December, 1899, the islands John Hay, Jesup, Nem Jahnson, are to the north-east of Cape Fligely; they do not exist. Cape Sherard Osborne is not a part of Prince Rudolf island, and no land was descried in that direction. Considering the length of time passed by members of the expedition at Cape Fligely in expectation of the return of Captain Cagni, and that a party travelled thence towards Hvidtland in search of Lieut. Querini and his companions, who accompanied Captain Cagni for a short distance and were lost on their way back, the non-existence of these islands seems to be indubitable. As for King Oscar Land and Petermann Land, Captain Cagni passed over their supposed positions on his journey towards the pole.

Captain Cagni made a first attempt to start on his journey in February, 1900, but the severe cold and details of equipment compelled him to return, and he finally left Teplitz bay on March 11, about the date when Nansen took his farewell of the *Fram* in 1895. He was well provided with dogs and sledges, and on April 25 he had marched as far north as 86° 33′ 49″ in 64° 30′ E. long. about, though the ice at first presented almost greater obstacles than Nansen encountered further towards the east. Worse, perhaps, than the pressure-ridges were the channels which opened in the ice when the wind blew from the west-north-west, and closed again when it veered to south-south-west. A change of the wind in any direction was followed by new channels. Further north, however, smooth stretches were met with, and good progress was made, as much as 20 to 22 miles a day. Captain Cagni decided to return, not because further progress was impossible, but because only sufficient provisions remained to feed the party till they reached Teplitz bay. When he had returned to about 83°, Captain Cagni found that the drift was carrying him rapidly towards the south-west, though he marched as nearly as possible to the south-east. The same experience befel Nansen, causing him some anxiety lest he should fail to strike Franz Josef Land. The result in Captain Cagni's case was that Neale and Harley islands were the first land sighted, and that the party had to make a troublesome journey over the moving ice north-eastwards to Rudolf island.

Meanwhile, the members of the expedition left at Teplitz bay were employed in taking observations, and making botanical and mineralogical collections. The meteorological records and observations of gravity and terrestrial magnetism will supplement those of Mr. Jackson at Cape Flora. Up to the present these observations have not been published, nor the hourly observations of the tide-gauge taken at the summer solstice and at the equinoxes. The auroral displays, so brilliant at

Cape Flora in the years 1894–97, were of small intensity; they were always of a whitish tint, and, beginning at the north-east, extended in the form of arcs and curtains towards the south-west.

Animal life was not abundant. The most common form was the polar bear, of which forty specimens were shot. Several of the birds already recorded in Franz Josef Land were observed. Ross's gull, hardly ever seen in Franz Josef Land, is also absent from Rudolf island, though occurring in large numbers on the neighbouring Hvidtland. Of plants thirty-nine species were collected, belonging to six genera of phanerogams and six of cryptogams.

The geology of the island, as far as can be judged from the brief remarks of the Duke of the Abruzzi to the Italian Geographical Society, is precisely similar to that of the more southern islands investigated by Dr. Koettlitz. There is the same basalt forming the mass of the island, and silicified wood was found near Cape Germania. A granite pebble on the same cape is an indication that the island was once submerged like the other islands; and a reindeer's horn at a height of more than 150 feet above sea-level and about 600 yards from the shore may, perhaps, have rested on a raised beach, as similar remains do on the coasts within the range of Dr. Koettlitz's examination.

It seems most probable, then, that the scientific results of this expedition other than geographical will simply confirm the conclusions previously arrived at, and render somewhat more complete our knowledge of the meteorology and magnetic variations in Franz Josef Land. The principal object of the expedition was to reach the pole or, at least, a higher latitude than had before been attained. In this it was successful, Captain Cagni having beaten even Nansen's record, and Italians are justly proud of their first achievement in arctic exploration.

DR. NANSEN'S SCIENTIFIC RESULTS.*

The two substantial volumes of the scientific results of the drift of the *Fram* and Dr. Nansen's adventurous journey over the ice, which have recently been published, give very full details of certain parts of the work, some aspects of which it may not be out of place to consider. We propose to refer specially to Prof. Geelmuyden's discussion of the astronomical observations, not only because of the able and thorough manner in which the author has handled his subject, but also because of the discrepancies between the positions fixed by observations, as finally calculated, from those provisionally accepted on the return of the expeditions. Our object is merely to

* 'The Norwegian North Polar Expedition, 1893–96.' Scientific results, edited by Fridtjof Nansen. Vols. i. and ii. Published by the Fridtjof Nansen Fund for the Advancement of Science. Christiania and London, 1900–1901.

place before those of our readers who may have been puzzled by the contradictory statements, a brief explanation which we trust will set the facts in their proper light. To begin with, we must deprecate the practice which has prevailed for many years of claiming credit for attaining a higher latitude than any predecessor, on account of a few minutes of arc in the calculated position. It is necessary to remember that a degree of accuracy which may be demanded in an examination or striven for in navigating a vessel in open water, is absolutely unattainable in polar regions, where the personal difficulties of observing in a very low temperature are combined with the unknown and unascertainable variations in refraction, the very low altitude of the sun, and the impossibility during the long polar day of seeing distinctly any other heavenly body.

In Dr. Nansen's case he out-distanced the best of his predecessors, not by miles, but by whole degrees of approach to the pole, and it is absurd to suppose, as some people actually appear to have done, that he attached any importance to the precise number of minutes by which he exceeded 86°. The great merit of his scientific work lies in quite another direction. It consists in the fact that by an exhaustive discussion of the observations of previous travellers he deduced the existence of a current or drift of water and ice across the north polar area, from the Siberian towards the Greenland coast, that he designed a practicable means of testing this theory, and that he proved it to be correct.

We question whether any practical traveller or geographer would find anything to excite surprise in the differences between the positions as first announced and as subsequently determined by the calculations of an experienced astronomer. The positions assigned to points of observation in the text and map of 'Farthest North,' and in other early publications, were only what they were expressly and repeatedly stated to be, of a provisional nature intended to give a rough general idea of the expedition, which would serve until more accurate computations became available. The public insisted on the very earliest information, and have no right to complain of the provisional nature of the first reports of scientific results. The complete discussion of the multifarious and complicated observations (astronomical, magnetic, meteorological, geological, oceanographical, etc.) could only be undertaken by specialists, whose labours would necessarily extend over many years, and, in fact, much of it is still uncompleted.

The discussion of the numerous astronomical observations has, however, now been finished under the supervision of Prof. Geelmuyden, and published in the second volume of the scientific results, with two new and excellent charts showing the routes of the *Fram* and those of Dr. Nansen and Lieut. Johansen. These final results, of course, differ from the preliminary and provisional values assigned in 'Farthest North,' and the differences are, as is not surprising, most conspicuous in the

results of the observations made for longitude during the first months of the sledge journey.

The provisional results had to be based chiefly on calculations made during the journey, with such rough corrections as appeared to be necessary after obtaining the correction of the watches (which had stopped on the journey) from Mr. Jackson at Cape Flora. There was no time after arriving at Cape Flora, still less immediately after returning home, to recalculate all the observations, and as a matter of fact Dr. Nansen was only able to compute some of the observations made in and near Franz Josef Land.

The result of Prof. Geelmuyden's work is to show the following facts:—

(1) The error in the assumed Greenwich time adopted after the regrettable stoppage of both Dr. Nansen's watches on April 13, 1895, is shown to be smaller than Dr. Nansen believed it to be on his return home. He estimated it in 'Farthest North' at 26 minutes (corresponding to 6° 30′ of longitude), while it now appears to have been only 15 minutes (corresponding to 3° 56′). This seems no very improbable mistake (deplorable as the occasion of it unquestionably was), as it means merely that, possibly on account of drifting of the ice, the travellers had been carried about 16 miles to the eastward of the position indicated by their carefully kept dead-reckoning.*

(2) The rate of Dr. Nansen's watch is shown to have been considerably greater than he assumed it to be from observations made before leaving the *Fram*. Thus the error in the assumed Greenwich time was always increasing during the month's journey, until it was as much as 29 minutes at the place where the winter hut was built, the position of which was fairly well determined by two different methods. The difference of the position worked out by Dr. Nansen in 1896 did not, we believe, differ by more than 2 miles from that determined by Mr. Armitage of the Jackson-Harmsworth expedition.

(3) A somewhat important result of Prof. Geelmuyden's discussion

* A few mistakes occur in the original longitudes calculated during the journey and quoted from the diary in 'Farthest North.' Thus on May 9, 1895, the longitude was given as 64° 20′ E., but it should have been 63° 24′ E., according to the correction for the watches assumed at the time, and Geelmuyden shows that the true longitude was probably about 67° 47′ E. On May 27, 1895, Dr. Nansen informs us that the longitude of 61° 27′ E. was given by a slip of the pen for 59° 7′ E., which it should have been with the assumed watch correction; Geelmuyden finds that the actual longitude was about 63° 52′ E. This is 30 miles east of the position where Payer placed his Petermann Land, which the Duke of the Abruzzi's expedition has now proved to be non-existent. In the maps published in 'Farthest North,' but not drawn by Dr. Nansen personally, there are several errors, such as placing the farthest north point in 90° E. instead of 95° E., the position which is repeatedly mentioned in the text, and which Prof. Geelmuyden has now shown was really 96° 30′ E. The text of 'Farthest North' contained several mistakes which did not occur in the Norwegian version, which must be looked upon as the authentic original of the book.

of the astronomical observations is, in his own words, that "there is another difficulty which for a certain period of the expedition is more serious than the stopping of the watches." This is that during April and May, 1895, nearly all the altitudes were measured with the sextant from the natural horizon. Two sets of observations made on April 2, 1895, one with an artificial, the other with the natural, horizon, seem upon closer examination to prove that in the special meteorological conditions (with temperature below $-22°$ Fahr.) the natural horizon was lifted perhaps 8′ or 9′, on account of irregular refraction, corresponding to a difference of nearly 10 minutes of time in the watch-error. This fact necessarily introduces considerable uncertainty into the determination of longitude, on the sledge journey in March, April, and May, 1895. It should serve as a warning to future arctic or antarctic explorers never to make use of the natural horizon when a theodolite or an artificial horizon can be employed. The sextant and natural horizon are, of course, the most convenient for use, and decidedly the least unpleasant at temperatures of from $-30°$ to $-40°$. Still, the additional trouble and even the risk of frost-bitten fingers should not be considered in the case where, as in those high latitudes, an error of 1′ of arc involves an error of 1 minute of time in the watch-rate. On the other hand, of course it must not be forgotten that in latitude 86° even an error of several degrees in longitude is comparatively unimportant, as 1° of longitude is equal to only 4 miles of distance, and even in 84° N. 1° of longitude does not exceed 6 miles. Thus the least accurate observations on Dr. Nansen's expedition were precisely those where the error corresponded to the least distance on the ground. The observations taken later on approaching Franz Josef Land were fairly accurate, as they were to some extent taken with the theodolite. As these observations supply data for controlling the error of the watches the latitudes and longitudes of the latter part of the sledge-journey may be looked upon as fairly accurate, as they are reproduced in the sketch-map of Franz Josef Land made at Cape Flora and published in 'Farthest North.'

It is pointed out that since the meteorological conditions on April 7, 1895, were almost the same as on April 2, it is probable that the latitude of the last meridian altitude taken towards the north should not be 86° 13′ N. (or 86° 12′·5, as Prof. Geelmuyden makes it), but only 86° 4′ N. As Dr. Nansen walked some distance northwards after the observation was taken, his extreme latitude may be placed at a minimum of 86° 5′ N. instead of 86° 14′ N.

We believe that Dr. Nansen most fully accepts all the corrections of his preliminary results, and we consider that he is to be congratulated on the manner in which Prof. Geelmuyden's searching criticism has established the substantial accuracy of what, though undoubtedly an important part of his work, is after all only subsidiary to the great objects he had in view.

DR. SVEN HEDIN IN THE LOB NOR REGION.

We are able to supplement the brief note given in our last number on Dr. Sven Hedin's operations during last winter from information received from the traveller himself. Writing from Chaklik, on the southern border of the Lob Nor region, on April 23, he states that after returning from the expedition described in the February number of the *Journal* (vol. xvii. p. 183), he undertook, in November last, a short excursion to the great or western Kum-kul, which he crossed and surveyed on three different lines. The districts passed through had previously been quite unknown. This expedition occupied only a month, and on December 12 Dr. Hedin was ready for a more extended journey, with a caravan of nine men, ten horses, and eleven camels. The route led first, by a somewhat difficult mountain road, to Khan-ambal, where the route followed by Littledale, lying further to the north, was touched for the first time. On Mr. Littledale's map the name appears as Nanambal. Beyond this Dr. Hedin appears to have still kept to the south of Littledale's route, making a circuit through the magnificent Anembar-ula range (partially explored by the Roborovsky expedition in 1894), which, according to existing maps, forms the link between the Astyn or Altyn Tag and the Nanshan. After returning to Khan-ambal he took a northerly route, crossing the desert to the mountain region which forms the easterly continuation of the Kurruk Tag. In the whole of this region Dr. Hedin was able to make many corrections of existing maps. During twelve long marches not a drop of water was found, and but for the lucky discovery of some snow on the third day the camels would have been unable to last out. By the help of the map constructed in March, 1900, Dr. Hedin easily found his way to Altimish bulak, whence a renewed visit was paid to the ruins on the north shore of the old Lob Nor.

At these ruins Dr. Hedin stayed a week, making plans and collections, taking photographs, and carrying out excavations. The most curious discovery was that of twelve Chinese letters in a complete state of preservation, with all the characters clearly legible, and of thirty small pieces of wood inscribed in Chinese characters with the name of the emperor, the year of his reign, the month, and even the day. They seem to have been of the nature of tickets. Some of them were read by a "Siah," who pronounced them to be eight hundred years old. A fine Buddhist temple was also discovered, with most artistic wood carvings. One of these showed a large fish, while fish bones, belonging to the same species now met with in the Kara-koshun, were found in a house. On one piece of wood of the size of half an octavo sheet of paper, Tibetan characters were found, while on one of the Chinese papers the place is called Lo-lan, mention being made of

the great road from Lo-lan to Sa-chu. A large collection of specimens and photos was made, and will form the basis of a most interesting study.

To the solution of the Lob Nor question Dr. Hedin has contributed further by carrying a level from the neighbourhood of the ruins to a point on the Kara-koshun. The result, he says, is fully to confirm his views. The starting point of the line was about 7½ feet above the level of the Kara-koshun, but immediately to the south of it was a depression (the old Lob Nor of Dr. Hedin) reaching about as much below that level. Between this hollow and Kara-koshun there is a protuberance of the desert soil, rising, according to a rough sketch given in the letter, somewhat above the level of the ruins north of the old lake-bed. Kara-koshun is, however, sending out an arm to the north in the direction of the latter, so that the protuberance above-mentioned is crossed by a north-to-south line of depression. The advance of the water was found to be so rapid that it was unsafe to camp on the lake-shores. Dr. Hedin says that the material he has collected on the Lob Nor region would in itself fill a volume.

As regards his future programme, Dr. Hedin proposed to stay some eight or ten days longer at Chaklik, and then to make a start on his final journey across Tibet. This he hopes to cross in a diagonal line from the Chimen-Tag to the sources of the Indus, passing, if possible, a little north of Lake Manasarowar. This journey will probably occupy almost the rest of this year. He would like to visit India from some point on the frontier, but will not return by sea, as he feels it incumbent on him to take back his Cossacks to some Russian town, Osh being mentioned as likely to suit best. It is, therefore, not until the spring of next year that we may hope to welcome Dr. Hedin back in Europe. If, as all wish may be the case, he returns safe and sound in about April next, his second great journey will have occupied no less than three years.

SHIP CANALS IN AUSTRIA.

THE scheme for the construction of ship canals in Austria, which has come up from time to time during the last twenty-five years, has been given definite shape by an Act which became law on June 11 last. The following works have been authorized, the cost of each to be borne proportionally by the provinces immediately concerned: (1) A canal from the Danube to the Oder; (2) a canal from the Danube to the Moldau at Budweis, connected with the canalization of the Moldau from Budweis to Prague; (3) a canal from the Danube-Oder canal to the upper Elbe at Pardubitz, connected with the canalization of the Elbe from Jaroměř (above Pardubitz) to Melnik; (4) a connection of the Danube-Oder

canal with the system of the Vistula and with a navigable section of the Dniester. The preliminary work is to be finished by 1904, and the whole completed in twenty years' time. The main artery of the system is admittedly the Danube-Oder canal, the course of which is shown in the sketch-map. Its length is estimated at 170 miles, and it includes an ascent of 500 feet, and a descent (to Oderburg on the Austro-Prussian border) of 350 feet. The crossing of the watershed at the Mährische Pforte offers great difficulties, comparable with those of the proposed "Mittelland" canal in Germany; the channel has to rise more than 200 feet in a distance of about $1\frac{3}{4}$ mile. This is nevertheless the easiest possible course; and it passes through the rich and populous district of Eastern Moravia, and will connect the capital with the coal regions of

SHIP CANALS IN AUSTRIA.

Upper Silesia. On the Prussian side only the canalization of the Oder from Kosel to Oderburg is required to join it to the German and Netherlands systems, and to open continuous water-communication between the Black Sea and the North Sea and Baltic.

The connection of the Danube with the Elbe by help of the Moldau does not offer so good financial prospects. Here several alternative routes are proposed (see sketch-map), but whether it is decided to follow the central Vienna-Budweis line, or to take the upper Austrian course more directly in connection with the new railway on the Trieste system, the great granite barrier encircling Bohemia has to be crossed, requiring an ascent of some 1600 feet, comparable with that on the French Loire and Rhone canal through St. Etienne. These difficulties are encountered in a comparatively poor region, and the upper Moldau itself, with its many deep-cut windings, is but ill adapted for canalization. On the other hand, the completion of this part of the work would place Vienna and the Danube in direct connection with Hamburg, and

would open navigable routes from North sea and Baltic ports to Constantinople and Salina 1500 and 2000 miles shorter than the respective sea routes. The chance of the highland regions benefiting much by the through trade is modified by the fact that it could only go on for six or seven months in the year.

The third of the proposed canals seems to have better prospects. It leaves the Danube-Oder canal at Prerau (Northern Moravia), and crosses the relatively low pass of the Trübauer (1420 feet), already traversed by the railway from Vienna to Prague, to the Elbe at Pardubitz. The upper Elbe itself flows through a rich region, and, unlike the Moldau, has a wide valley through which a canal could go direct, avoiding the windings: the rise and fall in the whole length of 112 miles is less than 700 feet. The difficulties of establishing communication between the Danube-Oder canal and the Vistula and Dniester are even less formidable; the elevations range from 800 to 1000 feet above sea-level, and the rock material to be cut is soft. A canal 300 miles in length through Galicia would certainly be a great advantage to that province, but its general importance might not be so marked, because the Dniester, with its many windings, cut deep in the Podolian plain, will probably never make a good route for ships, and because it seems unlikely that the rivers flowing towards Russia can be made easily available for commerce through Galicia. The regulation of the rivers for purposes of navigation will necessarily go hand-in-hand with the construction of the canals, and this gives the whole project a further significance for the extra-Alpine regions of Austria. As Prof. Penck has pointed out, it amounts to the utilization of the water resources of the Alpine region. But the construction of the new Alpine lines already begun is destined to affect the commerce of the plains quite as much. This is especially true of the "Tauernbahn," 50 miles long, which taps a stretch of 150 miles without railways, east from the Brenner to Bad Gastein; and the "Karawanken-Wacheinerbahn," a southward extension of the former, 80 miles long, which gives Western Austria and South Germany communication with Trieste, by Innsbruck and Salzburg. This second line to Trieste—that from Vienna over the Semmering being the first—will be open for traffic in 1908.

ANCIENT TRADING CENTRES OF THE PERSIAN GULF.

By Captain A. W. STIFFE, R.I.M.

VII. BAHREIN.

An account of the antiquities of the Persian gulf is hardly complete without a reference to these islands. I have briefly referred to the prehistoric period in my paper, No. III., March, 1897, and to the tumuli,

etc., described by Captain Durand and Mr. Bent. Passing to Mohammedan times, there are the ruins on the great island of an early city, now chiefly mounds, with the ruins of a large mosque, with two tall minarets, of Shiah * origin, doubtless built by the Persians during their long occupation; but there is much to learn about these remains—personally, I had little time to give to them. The present towns are very similar to other Arab towns—houses mostly poor, the sheikh's residence being a high fortified building. The harbour is shallow, and not suitable for very large vessels. It is well known as a centre of the pearl-fishery from the earliest times, and a large carrying trade has been carried on in native craft owned here. A great fleet of pearl-boats belongs to the place.

The most remarkable feature of Bahrein is the existence of numerous fresh-water springs, both on the land, on the reefs below high water, and also under the sea. The origin of these springs has not been satisfactorily explained. The Arab notion, that they come from the Euphrates, may be dismissed. The Arabian shore, so far as can be seen, appears to be low and devoid of water, except at el-Katif, where similar springs are found. The possible solution is that the water comes from the Persian mountains, which would require the assumption of the existence of a synclinal basin under the gulf with an outcrop of water-bearing strata at this point. This was suggested to me by an eminent geologist, and I offer it as a probable solution. The head of water at the submarine springs is noticeable; the water will rise through a tube —a hollow bamboo is used by the natives—above the surface of the sea so that vessels may be filled.

The principal remains of the Portuguese occupation are those of the large fort, which is quite ruinous. There are the ruins of many large buildings within the walls. It has had a moat, embrasures in the parapet, and casemated embrasures in the re-entering angles of the bastions. It is typical of the Arab that the people know nothing about its origin, and questioned us on the subject. At el-Katif, on the mainland opposite the islands, is also an old fort of Portuguese origin.

Colonel Taylor, formerly Resident in the Persian gulf, says that in the sixteenth century the islands were subject to the Persians, until the early part of the eighteenth century. It was conquered and reconquered by the Persians and Arab tribes. Nadir Shah appears to have held a firm grip of the islands, but after his death the sovereignty was held by various Arab chiefs from the settlements on the Persian coast until 1783, when it was taken by the el-Uttub Arabs, under whom it still remains. It is singular that Taylor does not give any information about the Portuguese occupation.

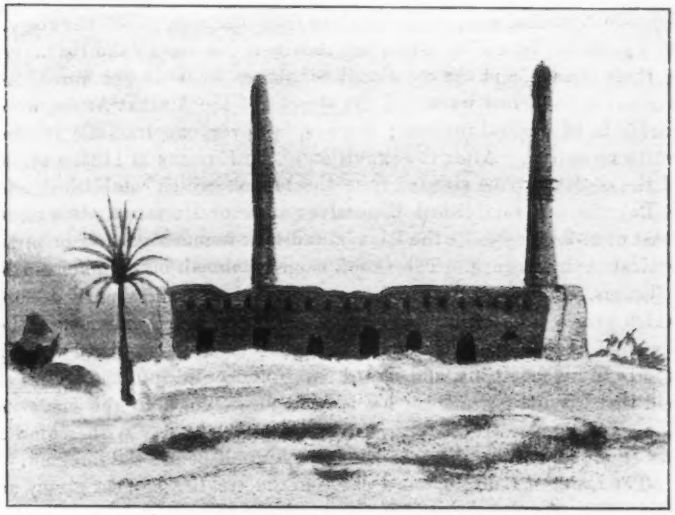
Abulfeda † mentions the island, and says it had 300 or more

* Sketch.

† 'Geographie d'Abulfeda,' trad. par M. Reinaud. Paris, 1848.

villages, and was two days' journey in length and breadth; vines, citrons, and palms abundant, with a great plain and pasturage—cultivated lands watered from springs. He also mentions the extreme heat and the pearl-fishery.

Shah Kodbodin (*sic*) of Hormuz, about 1320, reduced Bahrein and Katif, and subdued all the coasts of Arabia and Persia.* The account refers to Baharen, as "much talked of throughout the world, as well for the precious pearls found in its sea, as for the never-failing springs of fresh water that rise under it." Texeira says the Persians took it from Hormuz (*i.e.* the Portuguese) in 1602.



MOSQUE AT BAHREIN, OF PERSIAN ORIGIN.

In 1521, after the Portuguese had ruled Hormuz for about seven years, the King of Hormuz,† with 200 vessels and 3000 Arabs and Persians, and a Portuguese party of seven ships and 400 men under Antonio Corea, attacked Bahrein, which had refused to pay tribute for "Baharem and Catifa" to Hormuz, and consequently the tribute to the Portuguese was in arrear, and obtained a complete victory—"the island was restored to our Homager." The island was under "Mocrim, King of Lasah," and it seems the Portuguese did all the fighting. It is probable

* 'Lives of the Kings of Hormúz," by Torunxa, translated into Spanish by Texeira, now rendered into English by Captain John Stevens. London, 1715.

† 'Faria y Souza,' translated into English by Captain John Stevens. London, 1695.

the Portuguese forts were founded soon after this. Bahrein was one of the places that attempted to revolt against the Portuguese in 1522. In 1529 an attack was made on "Baharem," which had again revolted, but owing to sickness, and powder running short, the Portuguese had to abandon the siege.

In 1550 the Portuguese, with 1200 men in 19 vessels, assisted the King of Hormuz in an expedition against el-Katif, which was taken and blown up. The fort had been delivered up to the Turks by the people of el-Katif.

In 1560 the Turks sent an expedition from el-Basra to attack Bahrein, but the force had to surrender to the Portuguese under Don John de Noronha, who, with ten ships from Hormuz, raised the siege.

I have not been able to find any details of the loss by the Portuguese of these islands, and the occasional references to it do not agree. An account of the tribal wars, and the attacks of the Maskat Arabs, would hardly be of general interest; there is, however, one dramatic incident worth recording. After the expulsion of the Persians in 1783, a section of the el-Uttub tribe seceded from the branch which established itself at Bahrein, and established themselves at Khor Hassan, a place on the coast of al-Katr opposite the islands, and took to maritime war or piracy against their kinsmen. The Chief, named Rahmah-bin-Jaubír, and his followers, carried on their forays with varying success until 1826, in which year a determined engagement took place near Demmám. When the chief, then old and quite blind, found the day was utterly lost, he set fire to his magazine, and blew himself and crew into the air. It is said that his little grandson led the old pirate down to the magazine. The explosion destroyed also the vessel of the enemy with which he was engaged, and to which he grappled himself before the final act.

The Chief of Bahrein was a party to the treaties against piracy and maritime war, entered into by all the chiefs of the Arab littoral. His dominions are now virtually under British protectorate.

MR. MOLYNEUX'S MAP OF THE SEBUNGU DISTRICT, SOUTHERN RHODESIA.*

THE map of the Sebungu district, lying to the south of the middle Zambezi, which will be found at the end of the present number of the *Journal*, has been compiled by Mr. A. J. C. Molyneux, a geologist in the service of the British South Africa Company, from surveys made by him during visits to the country between 1894 and 1900. Mr. Molyneux points out that it will correct existing maps, which have been incorrectly drawn, in various particulars. The most important error, which occurs, *e.g.*, in the map lately issued to accompany the report

* Map, p. 352.

on 'Mining in Rhodesia, 1900,' consists in the reduplication of the features of a large part of the Sebungu district, owing to the confusion of the Sengwe river, a large southern tributary of the Zambezi, with the Sinasenkwe, a much smaller stream which joins the main river higher up, and separates the Sebungu and Mafunga busi districts. Thus the Lutope, Golongolo, Gungwe, and Busse, which appear in Mr. Molyneux's map as feeders of the upper Sengwe, appeared again in the former map as Lopolo, Colongolo, Gunow, and Busse. The Sebungu river, which gives its name to the district, joins the Zambezi above, not below, the confluence of the Logola; while Mkoka's kraal, also misplaced and duplicated in some former maps, really lies in the Sengwe river coal area. The map is based on a compass survey, and adjusted to the positions of the mouths of the Sengwe, Bume and Sanyate rivers, as shown on Stanford's map of Rhodesia.

CENTRAL BORNEO.*

Fifteen years ago the centre of Borneo, whence the chief rivers of the island diverge towards all points of the compass, was an almost unknown country. The mountains, clothed with dense forest, are not easy of penetration, and the rivers are obstructed by numerous rapids. Added to this, the savage character of the Dyaks, who murdered Müller on the upper Kapuas in 1825, rendered a journey into their territory very dangerous, and even at the present day a visit to the upper Mahakam is not unattended with risk, though the influence of the Dutch Government and of the Sultan of Kutei has done much towards the suppression of head-hunting and tribal feuds. It is chiefly to the late Heer S. W. Tromp, Resident of the Western Division, that the scientific investigation of the centre of Borneo is due. He himself ascended the Mahakam in 1885, and the Kapuas in 1888, taking a steamer as far as the mouth of the Mendalam, 400 miles from the sea, and continuing his journey by boat up to Lunsa. It was at his initiative that the expedition for the geological examination of the upper Kapuas basin, described by Dr. Molengraaff, was equipped with the assistance of the Society for the physical exploration of the Dutch colonies. Dr. Molengraaff, accompanied by Messrs. Büttikofer, Hallier, and Nieuwenhuis, ascended the Kapuas in 1894, and examined the greater part of the basin of the upper Kapuas, then travelling down the Katingan to the south coast. In the fine work he has published he describes his journey in detail, and carefully records all his geographical and geological observations, with the exact positions in which the various rocks occur. Beside this, the exact spots where the rock specimens were collected are marked on the maps, together with the numbers of the specimens in the collection, which is now in the museum of the Utrecht University. Accordingly, future travellers will have no difficulty in connecting their observations with those of Dr. Molengraaff.

The upper Kapuas region above Sintang consists of two mountainous belts

* 'Geologische Verkenningstochten in Centraal-Borneo' (1893-94). Door G. A. F. Molengraaff. Met Atlas. Pp. 529 and Appendix, 3 maps, 56 full-page illustrations and numerous figures, etc., in the text, as well as 14 maps and sections in the atlas. 'In Centraal Borneo. Reis van Pontianak naar Samarinda.' Door Dr. A. W. Nieuwenhuis. 2 vols. Pp. 308 and 369. Leiden: E. J. Brill, 1900.

running east and west, and separated by the low plain of the river, which, towards the east, passes into hilly country gradually rising to the mountain chains. The upper Kapuas range on the north is composed of alternate strata of phyllitic clay-slate, sandstone, quartzite, and greywacke. This, Dr. Molengraaff's "old slate" formation, is most probably of Jurassic age, though no fossils have been found in it by which to determine the age, and is the oldest yet found in Central Borneo, with the exception of metamorphosed slates on the Samba river. Granite and other primitive rocks seem to be absent, and dykes of eruptive rocks are of rare occurrence. The Müller mountains on the south are volcanic, and probably date from the late Cretaceous or early Tertiary period. In the Kapuas plain very interesting rocks occur in what Dr. Molengraaff calls the Danau (lake) formation. It is a system of clay-slates, diabase, and diabase-tuff, in which are layers of jaspers and cherts containing numerous radiolarian casts. These were found over a considerable area north of the lakes, while to the south of the Semitau hills tuffs, marls, and limestones also contain Radiolaria. Dr. G. J. Hinde describes the Radiolaria, with plates, in an appendix to Dr. Molengraaff's work. The thickness of the beds is not easily determined, because the strata are much folded, but it cannot be less than 100 metres. Another formation in the Kapuas basin is a series of beds of sandstone, greywacke, arkose, and conglomerate, which is proved to be of Cretaceous age by the presence of shells of *Orbitolina concava*, Lam. The rocks and their distribution are described in a special chapter.

Dr. Molengraaff devotes a chapter to the geological structure of Central Borneo, and another to its geological history. On these subjects he particularly warns his readers in his preface that he cannot speak with certainty, as his researches were necessarily confined to a small portion of the area under consideration, and the knowledge of the geology of Borneo is still only fragmentary. His praiseworthy caution enhances the value of the few remarks he ventures to make. The crystalline schists, the metamorphosed sedimentary rocks of the Schwaner mountains, and the old slate formation he forbears to discuss, as scarcely anything is known of their relative age with regard to other formations, and he only expresses the opinion that the last was laid down not very far from the coast. In pre-Cretaceous times Central Borneo lay deep below the sea. On the bottom of this sea the skeletons of Radiolaria accumulated, and at the same time the material of the diabase-tuff was ejected by submarine eruptions, and perhaps volcanoes on islands in the ocean poured their ashes into the sea. When the movements began which raised the bottom of this deep sea above the surface of the water is uncertain, but certainly in the Cretaceous period (in the Cenomanian, the horizon of *Orbitolina concava*), a part of Central Borneo must have been dry land. At the time of elevation folding began, and alteration of the rocks by pressure, and at more than one place intrusion of granite took place. Towards the end of the Cretaceous period, the folding process seems to have ceased, and all Central Borneo, with the exception of the upper Kapuas range, was again plunged beneath the sea, and the sandstone was deposited over all the older formations. But comparatively soon a contrary movement set in, the land rising more to the south than the north, where, indeed, it may even have sunk a little. Thus the great fault was formed which now separates the northern range from the Kapuas basin, and the borderland became a main drainage line along which the Kapuas flowed westwards. In consequence of other minor dislocations, the Kapuas basin was sometimes dry and sometimes invaded by sea-water, and brackish-water formations were deposited. These invasions were not confined to the upper Kapuas basin, but the Melawi group is also due probably to an encroachment of the sea. During the long period when the system of parallel faults was formed, volcanic energy exhibited itself

along several of the fissures, resulting in the formation of mountains in an east-and-west direction. Meanwhile erosion also played its part in the modification of the surface, and recent formations of sandstone and shale, which do not differ from the older sandstone formation from which their material was derived, but contain thick seams of brown coal, were laid down, the rivers carrying down large quantities of vegetable matter and driftwood, as they do at the present day. After the disturbances of the crust which, beginning in very late Cretaceous times, continued perhaps to the very end of the Tertiary period, no important movements seem to have taken place, and the subsequent modifications of the surface have been due to atmospheric and water denudation, which has extended the coast-line both on the west and south, and is still at work, though with diminished intensity.

Dr. Nieuwenhuis accompanied Dr. Molengraaff, and with him crossed the watershed towards the Mahakam, where news of disturbances among the natives caused them to turn back. In 1896 he returned to Borneo, determined to make another attempt to cross Borneo from east to west, and, thanks in great measure to the acquaintance he had made with many of the Dyak tribes on his former journey, and the services he had rendered them as a medical man, he met with no great difficulty or danger. The account of his journey occupies less than half the book, a large number of chapters being devoted to the Dyak tribes, especially the Kayans, their clothing, religious beliefs, agriculture, methods of fishing and hunting, industries, tattooing, etc. Dyaks are the original inhabitants of the Kapuas basin above Bunut. The Tamans live on the Kapuas above Putus Sibau, on the Mendalam, Palin, and Embalu. Below Putus Sibau are the Kantuks, and Kayans on the Mendalam. To the Kantuks are related the Batang Lupers of the lake region. The Pnihings have migrated to the Mahakam, leaving only a few families in the Kapuas basin; it is uncertain whether they are related to the Tamans. Occasionally Punans and Bukats, wandering Dyak tribes, make their appearance at Putus Sibau. To this place a Dutch official was first sent in 1896. It is the highest point on the Kapuas to which steamboats can ascend when the water is not very low, and was long ago selected by the Malays as their most advanced post and a depôt for trade with the Dyaks, and for the collection of forest produce—rattans, gutta-percha, and indiarubber.

Much was, of course, known of the Dyaks and their customs long before Dr. Nieuwenhuis' journey, but his detailed description of all that relates to their mode of life and industries will be very acceptable to ethnologists, and his illustrations of their tattoo patterns, carved sword-handles, pottery, and other utensils are numerous and interesting. Head-hunting seems to be no longer in vogue, as connected with religious customs, except among the wandering Bukats and Punans.

A map of the Mahakam valley ought to have accompanied the work.

REVIEWS.

AFRICA.*

Wylde's 'Modern Abyssinia.'

Amongst the few permanently valuable books that have recently appeared on African subjects, a prominent place must be assigned to Mr. Wylde's 'Modern Abyssinia.'† It is by no means a systematic treatise; indeed, the author would

* By Prof. A. H. Keane.

† 'Modern Abyssinia.' By Augustus B. Wylde, late Vice-Consul for Red Sea. 506 pp. Methuen, 1901.

almost seem to have a natural aversion from system of any kind, whether in the arrangement and treatment of the subject-matter or in composition, and especially the spelling of geographical and personal names, of which it may be truly said that *sine lege vagantur*. But beneath these surface blemishes, for which the publishers should be held at least partly responsible, there remains a great body of information valuable alike to the geographer, the naturalist, the student of sociology, and the statesman. An almost continuous residence of over a quarter of a century in Ethiopia and the adjacent lands, where he has played many parts and done useful work in his official capacity and as newspaper correspondent, has afforded the author every opportunity of acquiring a thorough knowledge of the country and its inhabitants. This knowledge is communicated in an attractive straightforward manner, which, despite some startling solecisms, disarms criticism, and may be accepted as trustworthy in all cases where the writer speaks at first hand or from personal observation. Some introductory and historical matter, confined mainly to the last thirty years, is followed by a useful chapter on the more salient geographical features of the land, and more particularly the drainage areas, to which special attention is paid. But this general survey fails to give a complete picture of the rugged Ethiopian plateau, because Mr. Wylde describes only those districts which he has himself visited, and his itineraries were, as he tells us, always confined to "the eastern half of Abyssinia."

This, however, is to be the less regretted since the main outlines of the whole region are fairly well known from other sources, while the detailed accounts of the less frequented eastern provinces, with which most of the remaining chapters are occupied, will be doubly welcome to students of the Ethiopian uplands. Many of such details will be received with surprise by most readers, and are of such a nature as to profoundly modify current views regarding the steppe-like and generally unproductive character of Tigré, Waag, Lasta, Yejju, Wollo, and some other eastern districts. It was in 1896, after the crushing defeat of the Italians at Adowa, on which some curious light is thrown, that these provinces were visited, the route running first in a general southern direction from Massawa and Asmara, across the Mareb river to Adowa and Abbi-Addi, and then across the western affluents of the Tacazze and Abai by the great market of Socota in Waag, and thence through the territory of the Wollo Gallas to Adis-Ababa in Shoa, present capital of Menelik's empire. From this point the journey was continued to Aden by the now familiar road through Harrar to the coast at Berbera. Here, of course, there was little new to report, and the main interest of the volume centres in the sections dealing with the eastern tracts, their rich sub-tropical vegetation, great natural resources, and the social relations of their Abyssinian and Galla inhabitants.

Many parts of Waag are described as "splendidly cultivated," yielding heavy crops of cereals, ample both for the local supply and for export to less favoured districts. Yejju also produces "everything that man wants in this world—tobacco of excellent quality, bananas, limes, oranges, cotton, coffee, sugar-cane, potatoes, vegetables of all sorts, red pepper, onions, garlic, wheat, barley, Indian corn, dhurra, tef and other grains, beans, peas, shipti plant for soap, plenty of milk and butter, oxen, sheep, chickens, and everything in abundance, and at absurdly cheap prices, also the most delicious white honey, for which the district is famed." The people also, both Christians and Mohammedans, are far more civilized than is commonly supposed, living in good well-thatched stone houses, growing, weaving, and dyeing their own cotton, tanning the hides and skins of their live stock, smelting their own iron and working it into spears, swords, knives, and agricultural implements. The charge of eating raw steaks from the live animal, a charge dating from the time of Bruce, is effectually disposed of once for all, and the peasantry are declared to be

neither thieves nor brigands, but friendly to strangers if properly treated, so that travellers complaining of being molested have no one to blame but themselves. Beyond a good engraving of Menelik, there are no illustrations, and the index is far too meagre. But the accompanying map shows for the first time the correct course of the Wanchit and Adabai tributaries of the Blue Nile, besides some rectifications of the Italian surveys of the water-partings between the Tacazze, Abai, and Hawash drainage areas. It should be mentioned that there are chapters on sport and big game, and several appendices with copious lists of the Abyssinian fauna, rainfall records, texts of international treaties, and other useful matter. Altogether the book is so valuable that the publishers would be well advised to issue a revised edition, in which some order might be introduced into the chaotic spelling, with such exuberant variety as Adis Abbaba, Adese Ababa, Adie Abbaba; Tajurrah, Tadjurah, and (on map) Tajurra; Ras Makinnan and Ras Makunan (in official documents); Negoosa and Negusa, and so on. A delightful account of bird-life is somewhat marred by the misleading statement that "Abyssinia possesses no humming-birds" (p. 493), being in this respect no exception to the rest of the Eastern Hemisphere.

Bonchamps Mission.

So much attention was absorbed by the Fashoda incident that little heed was paid to the Bonchamps Mission, which was all the time co-operating from the Abyssinian side with Commandant Marchand, advancing to the Nile from the west. Indeed, no detailed account of its movements has yet appeared in an English form, and as it traversed some new ground in the upper Sobat basin, geographers will be glad to have the very full and graphic description of the route by M. Michel in the 'Mission de Bonchamps.'* On the political aspect of the question, which has now merely an historical interest, it will suffice to remark that the author speaks with an almost cynical frankness, avowing that the two missions were planned as "the French dream from the Atlantic to the Red Sea in opposition to the English dream from the Cape to Cairo." It is generally supposed that the mission actually reached the Nile a short time before Marchand made his appearance at Fashoda. But it was not so, and M. Michel explains that the expedition got no farther than Nianiam, at the head of the Sobat river proper, in the Abigar (Nuer) territory, whence it had to retrace its steps through Buré and Goré to Adis Ababa, where it was broken up in April, 1898, about a year after setting out from Jibutil on its adventurous enterprise. Nevertheless, two members of the mission, MM. Faivre and Potter, with the Russian Colonel Artamanoff, did reach the Nile at the Sobat confluence on June 22, 1898, but in the suite of an Abyssinian force under the Dejaz-Mach, Tessama-Nado. Here were hoisted the Ethiopian flag on the right and the French on the left bank of the main stream, and it was these flags that were saluted by Marchand on July 9 on his way down the Nile to Fashoda. Of this bold attempt to create a French or Franco-Abyssinian zone across the continent nothing now remains except the valuable geographical discoveries which were made by the de Bonchamps and Tessama-Nado expeditions, and a graphic account of which will be found in M. Michel's book. The main result was the accurate determination of the greater part of the upper Sobat basin, which comprises most of the region between 6°–10° N. and 33°–36° E. On the

* Mission de Bonchamps. 'Vers Fachoda à la Rencontre de la Mission Marchand à travers L'Ethiopie.' Par Charles Michel, Second de la Mission. 554 pp. Paris: Librairie Plon (no date).

accompanying map are clearly shown the lower courses of the Birbir and Baro, which meet at Damabo just below the western scarp of the Ethiopian plateau to form the chief northern branch of the upper Sobat. The Ajubba, which was followed by the Abyssinian expedition from its source on the Suro uplands, forms the southern branch, the confluence at Nianiam being only a short distance above the well-known Anglo-Egyptian station of Nasser, on the Sobat proper. The total length of the lower Sobat between the junction of the two forks and the Nile is stated to be about 160 miles (263 kilometres), and the distance from the Nile to the Ethiopian foothills by the Sobat-Baro route about 350 miles (569 kilometres). All distances from Jibutil to the Nile by both routes, together with altitudes, daily meteorological records, and other valuable data, are given in carefully prepared tables, which occupy no less than twenty-two pages, and go far to fill up the hitherto blank spaces on the map of Southern Ethiopia. It may be mentioned that the Garafanda heights about the headwaters of the Ajabba and not far from the Omo basin are here renamed Mount Maurice Potter, in memory of the artist of the expedition, who died in this district during the return journey from the Nile. His name will also live in the numerous excellent illustrations with which M. Michel's volume is enriched.

Somaliland and the Comoros.

In 1900 M. Heudebert, whose name has for some time been associated with French colonial enterprise, made an excursion to the east coast of Africa, the results of which are recorded in a volume * sparkling with *esprit* and much shrewd observation of men and the lands visited. These ranged from the Suez Canal to the Mozambique channel, although the author is naturally interested mainly in the French settlements on the eastern seaboard. Hence the greater part of the book is occupied with the development of French activities from Obok round the head of Tajurra bay to Jibutil and thence inland to Harrar and Abyssinia. Indeed, so much space is given to the personal action of M. Lagarde and his successor M. Alfred Martineau, that his remarks seem largely inspired by these able and energetic administrators of the French Somali Coast possessions. In any case, the general reader will here find just the information which is so much needed, and is so difficult to obtain in English books, regarding the steady expansion of French enterprise in the region about the head of the Gulf of Aden. The story of the gradual eclipse of Obok by Jibutil is very well told, and many will read with astonishment that the latter place, with its fine harbour and railway already advancing towards Harrar and Shoa, is destined to become the future outlet for the trade, not only of Abyssinia, but also of a great part of the Somali and Galla lands. In a region which has in recent years been overrun by travellers, traders, sportsmen, and adventurers, our author found no opportunity of making any gleanings in the field of geography. But the ethnologist will here find an excellent account of the Danakils (Afars), who form a distinct and important branch of the eastern Hamites between the Abyssinian plateau and the Red sea, but about whom little information is available, except from Italian sources and the writings of Munzinger, Almqvist, and other specialists. Apart from the inevitable mangling of English names, the book is well printed, but, strange to say, has no maps, no index, or table of contents.

* Lucien Heudebert, 'Au Pays des Somalis et des Comoriens." 281 pp. Paris: Librairie Orientale et Americaine, 1901.

Fuller's 'Egypt and the Hinterland.'

Mr. F. W. Fuller has embodied in a bulky volume* a considerable amount of material collected by him during repeated visits paid to Egypt before and since the British occupation. There is a great deal of discursive matter on Mohammedan traditions, early history, persecutions, the Napoleonic episode, magic and witchcraft, with some other irrelevant topics, which look like padding. But enough solid information remains to justify the author's claim that the book may be regarded as a useful supplement and continuation of such standard works as Sir Alfred Milner's 'England in Egypt,' Mr. Silva White's 'Expansion of Egypt,' and Mr. W. Spencer Churchill's 'River War,' bringing events down to the close of the nineteenth century. Students of Church history will be attracted by the sections devoted to the Coptic Christians and their peculiar rites. But perhaps the most valuable part of the volume is that which is occupied with the present social conditions in the Nile valley—finance, the peasantry, mixed and national tribunals, administration of justice, land tenure, and the great drainage and irrigation works now in progress at Assuan and Assiut. "The fact is," writes Mr. Fuller, "that, as we stand upon the threshold of a new century, we are looking wistfully into an era of promise to Egypt in matters regarding water and justice which has never been dreamed of as possible—a complete water-supply, and a tangible system of justice all round, simplified by a complete revision of the whole Penal and Criminal Procedure Codes." Mr. Stanford supplies one of his useful large-scale maps, in which are clearly shown the respective spheres of the conterminous Anglo-Egyptian, French, Abyssinian, and Italian possessions, so far as determined by the latest international agreements. Unfortunately, no attempt has been made to conform the spelling of geographical names with that of the text, so that the usual discrepancies—Assiut and Siout, Assuan and Assouan, Massowa and Massawa, Fayum and Fayoom, Sudan and Soudan, etc.—still abound. But it is hopeless to look for consistency in these matters until some enterprising publisher undertakes the preparation of an authoritative geographical nomenclature.

The Fayum.

The volume of the Græco-Roman branch of the Egypt Exploration Fund, dealing with the recent discoveries of old documents in the Fayum,† contains much matter of quite exceptional interest, not only to students of palæography, but also to geographers and the general reader. It covers the two periods 1895–96 and 1898–99, and gives an exhaustive record of the excavations conducted by Messrs. Hogarth, Grenfell, and Hunt during those years in various parts of the Fayum depression. The general plan of publication is that adopted in previous volumes, the literary texts being printed as written except for the division of words, while the non-literary texts are reproduced in modern form with accents, breathings, and punctuation. A complete list of all the recovered documents, both papyri and ostraca (inscribed potsherds), is followed by a luminous treatise on the ancient geography of the Fayum, in which a laudable caution is displayed in the attempt to identify modern villages and other sites with those mentioned by the writers of

* 'Egypt and the Hinterland.' By Frederic Walter Fuller. Pp. xv. + 333. Longmans. 1901.

† 'Fayûm Towns and their Papyri.' By B. P. Grenfell, A. S. Hunt, and D. G. Hogarth, with a chapter by J. Grafton Milne. Pp. xvi. + 374. Offices of the Fund, 37, Great Russell Street, London.

Ptolemaic and Roman times. That the present Fayum was the Arsinoite nome (district) of antiquity there was never any serious doubt, and that the great Lake Mœris is still represented by the shrunken Birket el Karun had already been clearly shown by Major R. H. Brown, whose general views have been so far confirmed by the present excavations. Here it is now explained how the famous reservoir was finally transformed to a flourishing and populous province with a reduced lake at its lowest level. Amongst other topographical points that may be regarded as fairly established are the modern Senuris = Psenuris, Kom el Fatis = Crocodilopolis, Rubayyat = Philadelphia, Wadfa = Philoteris, Haret = Theadelphia, Umm el Bagarat = Teptunis, Umm el 'Atl = Bacchias, and some others more doubtfully, as indicated on the accompanying map of the nome. The reputation of Herodotus, so severely handled by Sayce and Mahaffy, is restored; his description of the province is declared to be "much more valuable than that of Strabo," and we are told that his general account of the Fayum is mainly confirmed by the evidence of archæology. Another important conclusion is that Lake Mœris can hardly, if at all, have been above sea-level after 200 B.C., when it was consequently not more than twice its present size. In Græco-Roman times, the area under cultivation was not much smaller than at present, since on the east side the old Bahr Wardan, which branched from the Bahr Yusuf south of Hawara, enclosed a large productive area which subsequently became desert. This will explain the statement of Strabo, that in his time "this nome is the most noted of all, both in aspect, fertility, and buildings." Of the papyri here published, a few facsimile specimens of which are given, the great majority consist of legal and official documents, petitions, farm and military accounts, tax and bankers' receipts, orders on payments, notices of deaths and private correspondence, some quite in the modern style. Thus a daughter to her mother: "Please give the share that falls to you of the fruit of the vineyard to your sister, and a bunch of grapes. I have sent you three pairs of bowls, and a little cup for little Thernas, and another for the daughter of your sister." More important are several fragments from Homer, Demosthenes, and Euclid, and quite a long passage from Chariton's historical romance, 'Chæreas and Callirrhoe,' already known from a Florentine manuscript. The general editing is above criticism, and the volume is enriched by no less than eighteen full-page plates of archæological and other illustrations.

Foà's Journey across Africa.

M. Foà (whose premature death is to be regretted) is to be thanked for a very clear and not too verbose account of his plucky journey across the continent, undertaken at the instance of the Minister of Public Instruction in 1894–97.* Such a journey, as he reminds us in the introduction, is no longer any great exploit in itself, especially if the traveller be furnished with unlimited credit, and lingers nowhere long enough to contract any local disorder. But it is another matter "when it has to be accomplished on foot, as was my intention, accompanied by a handful of trustworthy men, with relatively little money, sojourning everywhere, everywhere collecting materials profitable to geography, ethnology, natural history, the sciences in general, trade, the industries, and colonization." This is undoubtedly what M. Foà has done, although the more valuable results are not embodied in the present volume. So much time was given to sport that he has dealt with the subject in a special work ('Chasses aux Grands Fauves dans l'Afrique Centrale,'

* 'La Traversée de l'Afrique du Zambèze au Congo Français.' Par Edouard Foà. Pp. xii. + 323. Paris: Plon. 1900.

Paris, 1900). The scientific results also proved so important, that they have been reserved for a third volume, comprising his numerous astronomic, magnetic, climatologic, and meteorologic observations, together with a considerable mass of topographic, biological, anthropologic, and technical details. Little therefore remained for the work under notice, except an account of the route followed and of the incidents of travel, much of which has already been reported in the pages of this *Journal*, and need not here be repeated. It may be noticed that the explorer has been awarded the grand gold medal of the Paris Geographical Society, and that, if the *format* of the book is scarcely worthy of the subject, he has at least enriched it with forty-four full-page engravings, all from photographs taken by himself along the route. There is also a good-sized map which covers the whole field surveyed, and has been specially constructed from the author's itineraries and astronomic observations. It has the further merit of showing by distinctive red lines those sections of the route where new ground was broken. It may be added that this new ground lay almost entirely between the west coast of Lake Tanganyika and the right bank of the Congo above Nyangwe. In an appendix are collected some useful data on the economic and industrial development of the regions traversed.

Moore's 'Mountains of the Moon.'

Under an unnecessarily sensational title,* Mr. Moore has issued an excellent account of the regions traversed by the Tanganyika Expedition of 1899–1900. By 'Mountains of the Moon,' a title already usurped by Mrs. Pringle, he simply means the Ruwenzori range near the northern terminus of the expedition which he conducted with such signal success from the Zambezi delta along the Great Rift Valley (Dr. Gregory's Rift Valley), through the Nyasa-Tanganyika lands to the equatorial lakes, and thence to the coast at Mombasa. The great mass of the rich scientific harvest garnered by the way is reserved for treatment elsewhere. But enough remains to give tone to the present volume, and raise it far above the category of ordinary books of travel. Mr. Moore looks at his milieu with an unerring scientific eye, and is thus able to deal with several geological and biological subjects of great interest in a highly instructive manner. Such is the strange park-like aspect of so many parts of inter-tropical Africa, a feature which here finds an explanation as simple as it is beautiful. The apparently artificial character of the landscape is everywhere due to the euphorbia trees springing up on the bare sandy soil of old lacustrine beds, where nothing else will grow at first. Then other plants, thorns, climbers, and flowering shrubs, gather beneath the grateful shade of the euphorbias, gradually wax stronger, and at last strangle their foster-mother, themselves blending together in leafy clumps dotted over the long alluvial slopes, but still expanding, and some day merging in continuous forest growths. In this delightful way are discussed other problems, such as the reported oscillations in the level of Tanganyika, and the Jurassic marine fauna still surviving in that now freshwater basin. Highly informing is also the account of the Lake Kivu volcanic region, with its still active cones standing at a greater distance from the seaboard than any other on the surface of the globe. Here Speke's Mfumbiro is restored to its place of honour, if not as the name of a particular mountain, at least as the name of a district in which several fiery giants develop a great barrier between Kivu and Albert Edward. Hence "Mr. Grogan is quite wrong when he goes out of his way to point out that the Mfumbiro

* 'To the Mountains of the Moon.' By J. E. S. Moore. Pp. xvi. × 350. Hurst & Blackett. 1901.

mountains only exist in the minds of English statesmen. . . . The data in his map published by the Royal Geographical Society, where it differs from that of Count Götzen, differs also equally from the observations made by Fergusson during the present expedition; for these observations entirely confirm and merely extend the observations made by Götzen himself." It need only be added that the accompanying large-scale map is based on these very observations made by Mr. Fergusson, surveyor to the expedition. Several of the illustrations, which complete the equipment of this handsome volume, are from sketches by the gifted author. On the more general question of the African continent as a permanent field for European enterprise and settlement, Mr. Moore strikes a deep pessimistic note. "Nowhere," he writes, "on this vast interior, along any of the thousands of miles of route over which I have travelled, have I ever come across any places at all comparable to the very worst districts in New Zealand or the Far West of America. When low, the country is enervating, fever-stricken, and hot; when high, wild, changeable, and wet. Can any one who has been in Equatorial Africa name a single place anywhere where he would like to go and live, and where he thinks he could make farming pay in any other sense than that of providing him with food stuffs until he died of fever?"

Bentley's 'Pioneering on the Congo.'

Although occupied mainly with the progress of missionary work in the interior, the Rev. M. Bentley's two profusely illustrated volumes* contain much matter of interest to the general reader, and even to the student of geography. Indeed, the well-known author of 'Life on the Congo' and of the standard 'Dictionary and Grammar of the Kongo Language'—one of the best contributions yet made to the study of Bantu philology—could scarcely write on any Central African topic without being instructive. Without entering into details, with which most geographers are already familiar, it will suffice to say that they will here find a clear summary of recent geographical, political, and social development conveniently arranged for purposes of general reference. Attention may be drawn especially to the chapters on "The Old Slaving Days," "The Congo Basin and its Inhabitants," "Exploration of the Upper River," and "The Government of the Congo Free State," although in the last-mentioned the methods adopted by some of the Belgian officials in developing the resources of the country are treated perhaps with too light a hand. Most of the illustrations are from original sources, and the large map comprising the whole of the intertropical region between 5° N. and 19° S. shows with praiseworthy impartiality all the present and abandoned stations of the Protestant and Roman Catholic missions.

Senegal.

To an invitation from the management of the Paris Exhibition of 1900 to report on the biological and geological relations in Senegal, a number of French savants have responded with a compact little volume,† in which they have contrived to communicate a considerable mass of well-digested information on the ethnology, botany, zoology, and physical characters of that region. Naturally there was not much fresh matter to be gleaned from such a well-known and well-

* 'Pioneering on the Congo.' By the Rev. W. Holman Bentley. 2 vols., with map and 206 illustrations. The Religious Tract Society, Paternoster Row. 1900.

† 'Une Mission au Sénégal: Ethnographie, Botanique, Zoologie, Geologie.' Par MM. Dr. Lasnet, A. Cligny, A. Chevalier, P. Rambaud. 348 pp. Paris, 1900.

administered colony, and the chief value of the book consists in its clear and systematic treatment of the multifarious contents. More than half the volume is devoted to the races of Senegal, whom Dr. Lasnet classes under three main divisions: *Semites*, including "Moors" (Arabs and Berbers), and Fulahs; *Negroes*, comprising several branches of the widespread Mandingan family, with Wolofs, Serers, and other aborigines; *Half-breeds*, such as the Toucouleurs, Fulah and Wolof cross, and the Khassonke's (Fulahs and Mandingans). Here the faulty terminology might be amended by substituting *Caucasians* for *Semites*, a term quite inapplicable to the Berbers and Fulahs. The history, usages, and social institutions of the several races are described at some length; their geographical distribution is shown by a carefully prepared ethnological map, and the various types are well illustrated by a series of excellent reproductions from photographs.

The Berbers.

In the spring of 1900 Mr. Randall-Maciver and the late Mr. A. Wilkin, acting on the suggestion of Mr. Flinders Petrie, with whom they had been working in Upper Egypt, paid a visit to the Kabyles and Shawíya Berbers of Algeria, their object being to trace, if possible, the connection of these aborigines "with the most ancient races of Egypt by the methods of anthropology, by collections of pottery, of designs, of physical measurements, and by observation of their every-day occupations, and of the monuments of their ancestors." The results of the expedition are embodied in two works of very different character—one by Mr. Wilkin * covering the incidents of the journey, and seasoned, so to say, with a dash of science; the other, by both investigators,† dealing exclusively with the scientific and technical sides of the subject. The first, which is written in the bright, readable style suitable to a popular record, need not detain us, since it moves in familiar ground where the "incidents" fall necessarily short of the sensational, while the serious element inevitably recurs in the second book. Here the outcome was disappointing for the explorers, and it may be added that had they possessed a more ample knowledge of the ethnical relations, they might perhaps have given up the expedition, or else conducted it on somewhat different lines. How little their ethnological lore is abreast of the times may be inferred from the fact that they seem to be entirely unaware of the new theories advanced by Sergi and myself on the primordial relations of the Mediterranean peoples, a subject indispensable to the present inquiry. The Shawíyas, also, and the Kabyles, the two Berber groups visited by them, are unaccountably equated with the Zauēkes and Kabales of Herodotus, the fact being that both of the former terms are of comparatively recent (Arab) origin, and only adopted by these Hamites under protest. Shawíya, meaning "shepherds," is written in the French fashion, *Chaouia* throughout, and we are told to pronounce it *Sharweeu*, with an intrusive cockney *r*. After a close study of the Egyptian and Berber potteries and the measurement of a great many Shawíya and Kabyle heads, the general conclusion arrived at was that it was "impossible any longer to maintain the view that the prehistoric Egyptians were Libyans," but that the resemblance of the earthenware and of the character and details of the decorative art point at a very intimate relation between Libya and Egypt in prehistoric times. The reference to Prof. Erman is unfortunate, because that philologist is entirely astray respecting the Semitic affinities

* 'Among the Berbers of Algeria.' By Anthony Wilkin. Pp. xiv. + 263. Fisher Unwin. 1900.

† 'Libyan Notes.' By David Randall-Maciver and Anthony Wilkin. Pp. viii. + 113, 4to. Macmillan. 1901.

of the Egyptian language. There is a great parade of tables, diagrams, and craniometrical measurements, which, if they prove nothing, the fundamental nature of the problem being misunderstood, will be none the less acceptable to students of racial characters.

African Rubber.

Owing to various causes, but chiefly to the ever-increasing demand of the home market and the primitive methods of exploitation in use amongst the natives, the supply of rubber from the German West African possessions has greatly fallen off in recent years. To remedy the evil and place the industry on a sound footing, a mission was organized in 1898, under the auspices of the "Colonial Economic Committee," with instructions to study the question on the spot, and especially to explore other parts of the interior in quest of such caoutchouc-yielding plants as might be found most suitable for cultivation in the Kamerun and Togo territories. Herr R. Schlechter, who was appointed leader of the expedition, gives what may be taken as an official report on the results in a handsome volume,* enriched with a considerable number of full-page and inset illustrations, chiefly botanical (landolphias, kickxias, and other rubber-bearing species), but with neither maps nor index, and a very jejune table of contents. *En ravanche* students of economic growths will here find a very full descriptive table in Latin of useful African plants, which occupies no less than sixty pages, and is arranged both in respect of families and genera according to the system proposed by Dr. A. Engler. The regions visited were the Congo basin, the Sanga-Ngoko districts, and the hitherto unsurveyed parts of the Kamerun and Togoland, and the committee certifies that its mission "has fulfilled its object and obtained practical results, especially by the introduction of rubber-culture in a large way on the Kamerun plantations."

Kamerun.

It would require several pages of the *Journal* to give an adequate notice of Herr Dominik's somewhat formidable volume,† which, although covering a period of only six years (1894–1900), may claim to be one of the most instructive of recent contributions to the development of European culture in tropical Africa. As a soldier, the author has little to say on strictly scientific or technical matters. But his military duties brought him into daily contact with all classes of the community—officials, traders, planters, missionaries, and natives—in every part of the Kamerun and its extensive hinterland, and these brightly written pages show what excellent use he has made of his varied opportunities. Much space is naturally given to the numerous military expeditions in which he took part, and by which the colony has gradually broadened its confines in the direction of Adamawa. But the author had also an eye for the social and economic relations, and in these respects he is able to speak of a marked improvement in the condition of the natives. Here also the absence of an index is much to be regretted. But there is a good map of the Kamerun district, and the book will also be valued for its numerous illustrations, many of which are choice specimens of the German engraver's art.

* 'Westafrikanische Kautschuk-Expedition (R. Schlechter), 1899–1900.' Pp. viii. + 326. Berlin: Verlag des Kolonial-Wirtschaftlichen Komitees. 1900.

† 'Kamerun, Sechs Kriegs- und Friedensjahre in deutschen Tropen.' Von Hans Dominik. Pp. viii. + 315. Mittler & Sohn, Berlin. 1901.

THE MONTHLY RECORD.

EUROPE.

Ice during Summer in the Auvergne Mountains.—A note by M. P. Glangeaud appears in the *Comptes Rendus* (July 15, 1901), on the subject of ice-formation during summer among the extinct volcanoes of Auvergne. The ice is found in certain funnel-shaped depressions, resembling miniature craters, with which the surface of the great lava-flow (Labradorite) of the volcano of Côme is broken. The formation of the ice is accounted for by the writer thus: The rocks of this volcanic region, the most difficult of access of all Auvergne, are generally of a porous nature, and, resting on the original floor of the valleys over which the water now follows an underground course, absorb large quantities of water, which is brought to the surface where the lava sheet is thin. Under the influence of the solar heat an intense evaporation is produced, which reduces the temperature to such a degree that ice is formed. This explanation is supported by the fact that it is just in the hottest time of the year, when the shade temperature reaches 93°, that the ice-formation has been noticed. Only one ice-hole is generally known—that near Pontgibaud called by the country people the "Trou de la glace," but similar localities are to be found elsewhere, as, *e.g.*, in the basaltic lava-streams of Aydat, which had their origin in the volcanoes of La Vache and Lassolas.

Scientific Investigation of the Murman Sea.—A Russian expedition, under the leadership of M. N. Knipovich, visited the Murman sea in the years 1898, 1899, and 1900, for the purpose of inquiring into the hydrological and biological conditions, chiefly in connection with the fisheries. Amongst the fishes caught were several not hitherto reported from the Murman sea. Such were the semi-transparent *Cyclogaster gelatinosus*, various species of Lycodes, Lumpenus, etc.; also *Platysomatichthys hippoglossoides* and the blue wolf-fish (*Anarrhichas latifrons*). A very unexpected catch was a large tunny, more than 6½ feet long, a form never seen before north of the Lofoten islands. Another rare species was *Paralepis borealis*, never found before on the Murman coast, or even in European seas. A specimen of *Nemalycodes grigorievi* was also procured, the third hitherto known, and *Raja fyllæ*, known before only on the American coast. The large shrimp *Pandalus borealis* was found in large numbers, both in the inner parts of the Kola and Motovski bays and in the open sea. Not a single specimen had been caught before, except in the Varanger fiord. It is associated with a special fauna of molluscs, fishes, Pantopoda, Crustacea, and Echinodermata, which constitutes the chief food of the more important marketable fishes. A large quantity of invertebrates were brought up by the trawl. Sometimes tens or even hundreds were captured in a single haul of species which had never before been met with in the Murman sea, or very seldom. The trawl occasionally contained, among other organisms, large numbers of *Gorgonocephalus*, or large *Antedon*, *Psolus*, *Trochostoma*, *Myriotrochus rinkii*, species of *Neptunea*, *Ukko*, *Buccinum*, etc. *Asterias stellionura* and *panopla*, *Schizaster fragilis*, etc., were abundant. Marketable fishes proved to be more widely distributed than was expected. Cod, *Sebastes norvegicus*, and *Drepanopsetta platessoides* were found from Bear island almost to the coast of Novaya Zemlya, and from the Murman coast up to lat. 75° N. The blue wolf-fish, considered to be a Finland species, was caught not far from Novaya Zemlya, among other places. With the marketable fishes was associated a typical arctic fauna, both of fishes and invertebrates, which was observed on the banks of the Kanin peninsula and further east, in the direction of Novaya Zemlya. Cod occur in very low temperatures, 28½° Fahr. for instance, and in water only a little warmer, about 34° Fahr., all the chief Murman fish were caught. Very successful

hauls were made in the end of May on the Kildina bank; in Motovski bay at the end of June; and on the Teriberka bank at the end of August, when the temperature of the water was 34° to 31°·2 Fahr. Some fish, hitherto considered to be comparatively rare in the Murman sea, were found to be quite common, the *Sebastes norvegicus* for instance, while *Drepanopsetta* is not nearly so rare as might be expected. An unusually rich fauna of crustaceans is distributed over the sea as far north as 75°, and westwards to Bear island. Among these *Pandalus borealis* is especially conspicuous, generally occurring at depths of more than 100 fathoms, but sometimes in the fiords at very moderate depths. The stomachs of codfish were sometimes full of them. On the banks, *Mallotus arcticus*, *Ammodytes tobianus*, or herring, seem to form the chief food of the cod. Perhaps the bright silvery colour of these fishes render them more conspicuous than the shrimps, but in the semi-obscurity of depths of 100 fathoms they are probably detected by their strong odour. As a rule there is no great quantity of fish at a distance from the coast, but at certain times a considerable number of excellent quality may be obtained. The extensive banks to the north of Kildina and the Teriberka are very productive fishing-grounds. Haddock and plaice are very plentiful on the banks of the Kanin peninsula, and off Bear island fish were very abundant. The deep mud-covered tract of the Murman sea contains no marketable fish, unless the Polar cod (*Gadus saida*) be reckoned as such. The fishing industry is capable of great development; in 1893 the Russian fishermen, about 3500 in number, gained on an average about £9 10*s.* per head, and in 1894 £11 4*s.*, whereas at the Lofoten isles the average is £9 1*s.* per head, and in 1894, £10 14*s.*, whereas the average is £8 18*s.* to £9 9*s.* The temperature observations were not all taken at the same fairly limited areas, and the influence of the fiords had to be allowed for. The curves that have been traced do not, however, show any great deviations from the actual temperatures, except in the upper layers of water, where there are sudden and irregular variations due to particular causes. On the whole the highest readings for the three warmest months were, in 1898, 49½° Fahr. on the surface, and falling to 42½° at a depth of 250 metres (about 137 fathoms), while in 1899 the corresponding readings were 46½° and 42°. The summer heat penetrates very gradually to the lower depths, so that the warmest months are July to September on the surface, and September to January at 250 metres. At this time the water in the depths has a higher temperature than the surface water. In the coldest months the temperature is 34° to 38° in the upper layers, and 34° below. Fiords shut off from the sea by a submarine bar have cold water in their lower depths, as in other lands. In the Katherine harbour the low temperature of 35° prevails throughout the year (*Bull. de l'Académie Imp. des Sciences de St. Pétersbourg*, May, 1900).

ASIA.

The Distribution of Malaria in the Ganges Delta.—A paper by Dr. Leonard Rogers in the *Journal of the Asiatic Society of Bengal* (vol. lxix. part ii. No. 4) gives the results of investigations of considerable importance in relation to the question of the distribution of malaria and its causes. The tract of country dealt with extends on the east bank of the Hugli for 25 miles from Calcutta, an area long looked upon as water-logged and very malarious. A scheme for re-excavating certain silted-up drainage channels has been on foot for some time, but an unusual prevalence of fever in 1889 was the immediate inducement to the investigations, which were carried out as follows: As far as possible, one hundred persons, half of them children, were examined in each municipal ward, with a view to ascertaining the numbers suffering from enlarged spleen, this being taken as the best test for the degree of malaria prevailing. Secondly, the level of the

ground-water was taken in as many wells as possible. Thirdly, the drinking-water supply was carefully noted. Fourthly, the number of fever-cases treated was compared with the monthly rainfall over a series of years. And, lastly, observations were made on the distribution and monthly variation in the distribution of the *Anopheles* mosquito. In regard to the first subject, it was found that places on the banks of the Hugli have a much lower spleen percentage than those further east, which, however, comparison with other places showed to be in no worse position as regards spleen than the typical Lower Bengal municipality. The healthiness of the riverine area cannot be explained by any theory of water-logging in the more inland districts, no marked or constant difference in the ground-water level having been observed. The explanation, both of the broad characteristic above noted, and of the ward variations in spleen-rate, was found in the varying character of the water-supply, the most healthy wards of all being those using filtered water, the next those using river-water, and the most malarious those with only a tank supply. As regards the breeding-grounds of the mosquitos, Dr. Rogers found that, so far from these being limited, as is supposed by Major Ross, to small pools with no fish, the *Anopheles* larvæ swarmed both in large tanks and in small pools, the former, as well as some of the latter, abounding in fish. In the 5 square miles of Maniktola alone there must be several hundred tanks, so the chance of destroying the larvæ must be exceedingly remote. Dr. Rogers also failed to find any cases of fever near the infected tanks in hot weather, and he considers it open to question whether malaria is contracted only or even most commonly through the agency of mosquitos. A good water-supply is, at any rate, he thinks, an important prophylactic against malarial fever.

AFRICA.

Sir Harry Johnston on Uganda.—Sir Harry Johnston's final report, supplementing the preliminary report noticed in the *Journal* for February last (vol. xvii. p. 151), was issued during July. The more purely geographical results of the special commissioner's travels over the greater part of the protectorate are not dealt with in the report, but will, it is hoped, form the subject of a paper during the next session of the Society. All who are interested in the development of Africa will, however, find much that is instructive and suggestive in the report, although some will no doubt be disposed to think that Sir Harry Johnston takes an unduly sanguine view in certain matters. After a brief sketch of the recent history of the protectorate, the commissioner sums up what he considers the principal reasons why the possession of the country is of importance to Great Britain. Apart from the question of the water-supply of the Nile, and the necessity that one at least of the main sources of that supply should be under our control, he holds that on account of our Indian Empire we are compelled to reserve to British control a large portion of East Africa, which is, and should be from every point of view, the America of the Hindu, where Indian trade, enterprise, and emigration may find a suitable outlet. The large sums hitherto spent by the British taxpayer may, Sir H. Johnston thinks, quite possibly be ultimately repaid, while a positive profit may be expected from the opening up of the region to British commerce, and, in a less degree, settlement. In the eastern part of the Uganda protectorate there is, we are told, a tract of country of about the size of Belgium almost without parallel in tropical Africa. It is admirably well watered, with a fertile soil, covered with noble forests, and to a great extent uninhabited by any native race, and, moreover, as healthy for European settlers as the United Kingdom, British Colombia, or temperate South Africa. Of the resources, from which a profitable trade might be developed, rubber is placed first, some 30,000

square miles being more or less densely covered with rubber-producing trees and vines. This area has been set apart by agreement with the native chiefs as directly under the control of the crown. Natives are, however, permitted to collect the rubber on condition of following the rules prescribed by the scientific department, which under its director, Mr. Whyte, has already done much to instruct the people in the proper methods of procuring the rubber. Of the prospects of success in the domestication of the elephant, zebra, ostrich, wild ass, and even the giraffe, Sir H. Johnston speaks hopefully. An important section deals with the question of the advantages derived by the natives of the country from British rule. It has become of late somewhat the fashion to lay stress rather on the evils than on the benefits resulting from the establishment of European control over native races, and it is therefore satisfactory to learn that the benefits in the case of Uganda are very real and fully appreciated by the natives themselves, who have a lively remembrance of the horrors enacted under their native rulers. The report does not say much of the future organization of the country, but the commissioner insists on the importance of governing as far as possible through native agency. The map is useful as showing the limits of the provinces and districts into which the protectorate has been divided.

The Uganda Railway.—The Parliamentary paper recently issued on the subject of the Uganda railway is largely made up of technical details respecting the construction of the line, on which Colonel Gracey, R.E., was, towards the end of last year, commissioned to make a report. The sections of this report, which are of most general interest, are those dealing with the probable date of completion, and with the present traffic and future prospects of the line. Colonel Gracey reports favourably on the whole on the manner in which the work has been carried out, though criticizing the methods employed in certain minor details. In February last the rails had reached mile 476, and, allowing a margin for contingencies, Colonel Gracey estimates that they should reach Lake Victoria about October of this year, that the earthwork should be completed about March, 1902, and the American viaducts a very few months later. This will not, however, mean that the whole work is completed, there remaining almost the entire ballasting, repairs to banks and cuttings, terminal works at Kilindini and Port Florence, etc. While approving of the site chosen by Mr. Whitehouse, the chief engineer, for the temporary terminus at Port Florence, Colonel Gracey holds that Port Florence itself cannot be considered a desirable site for the large town which will certainly spring up round the railway port, being a shallow and land-locked inlet, with no tidal movement or rivers to purify the water. With regard to the prospect of the line from a paying point of view, he says that no sudden developments can be expected, but that, although the immediate prospects are not very bright, a small net return on the capital expended may be reasonably looked for after about 1910. The rates and fares now charged (though very much lower, it may be remarked, than those on the Congo railway) are high as compared with those charged in India, and Colonel Gracey strongly urges the necessity of a reduction, especially in the case of such articles as salt, food grains, seeds, hides, indiarubber, coffee, etc., the cheap transport of which is vital to the interests of the country. With present charges the railway will prove useless for commercial development. Without it, however, it would be impossible for any length of time to hold the country round the headwaters of the Nile.

The Upper Branches of the Sobat.—In putting before the readers of *Globus* (vol. 79, p. 379) an account of Major Austin's work on the Sobat, as described in the May number of the *Journal*, Herr Brix Forster calls in question the identification by that officer of the river called by him Akobo with the stream traced from

near its source by Wellby (*Journal*, vol. xvi. p. 302). Owing to the scanty indications furnished by the latter traveller, the correct identification of his river must be a matter of difficulty, and there is no doubt something to be said for Herr Forster's views. How, he asks, can the Ruzi of Wellby, which flows generally from south to north, be the Akobo, which, as originally explored by Böttego, was found to have a course from south-east to north-west? The latter river, in Herr Forster's view, is that seen by Wellby joining the Ruzi from the south-east in 7° 50′ N., or very nearly in the latitude given by Austin for the junction of the Akobo with the western branch of the Pibor. This certainly fits in with the statement of Wellby that after the junction the combined river flowed *north*. On his sketch-map, however, the direction is given as north-west, or still that of the Akobo, and this is maintained for some 30 miles below the junction. Again, Böttego showed various small streams as joining the upper Akobo from the south, one of which might well be the (eastern) Ruzi of Wellby, which Dr. Donaldson Smith's latest journey shows to be quite an insignificant stream in its upper course. Herr Forster makes no reference to the work of the de Bonchamps Mission as embodied in M. Michel's map, and this seems to favour Major Austin's identification. The map alluded to shows the Pibor (on which is the village of Akobo) and the Ajuaru in a way which agrees fairly well with the delineation by Wellby of the two Ruzi's, except that the point of junction is placed much further north-west by the French travellers. The actual junction, however, does not seem to have been seen by Wellby, who was at the time on the east side of the Eastern Ruzi. Major Austin's identification of the river seen by Wellby coming from the south-east with the Gelo, seems, however, more doubtful, owing to the great discrepancy in latitude. But it is to be remarked that another stream is shown on Wellby's map as entering from the east a little north of 8°, and this might perhaps be the Gelo. It is obvious that the names Kier or Baro on that map should properly be assigned to the stream there marked Sobat.

Dr. Kandt's Latest Journeys.—Following up his exploration of the Nyavarongo, the northernmost of the upper branches of the Kagera, Dr. Kandt has carried out his intention of completing his investigation of the Nile sources by the survey of the Akanyaru (*Mitt. aus den Deutschen Schutzgebieten*, 1901, part 2). The expedition for this purpose was undertaken in July of last year, the traveller proceeding first to the Rusizi valley with the intention of climbing the slopes of the eastern escarpment to the neighbourhood of the source of the Akanyaru. The dread of the unknown forests, with which the slopes are clothed, exercised such an influence, however, on his men (natives of Ruanda) that Dr. Kandt was forced to give up the attempt and proceed first to the junction of the Akanyaru with the Nyavarongo. On the way thither he visited the court of the Sultan of Ruanda, where the deception hitherto practised on all Europeans by the substitution of a fictitious for the real sultan was, to Dr. Kandt's surprise, abandoned. The true title of the sultan is said to be Mwami, not Kigeri, which was the popular name of the former Sultan Luabugiri. Dr. Kandt reached the confluence of the rivers at the end of the dry season, the most favourable time for judging their relative size, as the papyrus swamps which fringe the true channels were dry. The result of the renewed measurements was to emphasize more than ever the relative importance of the Nyavarongo, which had double the width, with four or five times the rate of flow, of the Akanyaru, the depth being about the same. After surveying a portion of the Kagera below the junction, Dr. Kandt ascended the Akanyaru, which flowed from the south through a wide papyrus-filled valley, cleared for cultivation beside the stream, and giving evidence of most fertile soil. The lakes of the Kagera were dry at the time, but one containing water was found to communicate with the

Akanyaru, and is identified by the traveller with the Lake Akanyaru of Stanley. At the point where the river had been crossed by Baumann, Dr. Kandt left it, as its upper course, flowing from north-west to south-east, was already known to him. He visited the mission station of Isavi, where many signs of progress were noticed, and from this centre made excursions through the neighbouring districts. He had begun to master the Ruanda language, of which he was preparing an extensive grammar and vocabulary, and was thus able to make good progress with his ethnological researches, which brought to light material of much interest. Dr. Kandt, who hopes to continue his scientific work in Ruanda for some time longer, looks forward to the day when the country will be opened to European colonization by means of a railway.

The Kivu Frontier Delimitation: Death of Dr. Lamp.—The death, from sunstroke on June 21, of Dr. Lamp, leader of the German section for the delimitation of the frontier between German and Belgian territory in the neighbourhood of Lake Kivu, has lately been announced. Dr. Lamp was eminently fitted for the work with which he had been entrusted, having worked both at the Geodetic Institute of Berlin and at the Observatory at Kiel, where he was also a professor at the University. Much had been hoped from his labours towards the improvement of the map of Eastern Central Africa, and something had already been done in this direction, in particular by the accurate fixing of the longitude of Tabora. The death of the leader of the Belgian section, from black-water fever, has also been reported.

Death of Mr. W. H. Harding in Barotseland.—The news comes from Fort Monza, in Barotseland, of the death of Mr. W. H. Harding, who was acting as secretary to Colonel Colin Harding, C.M.G., and who, in addition to being in charge of the post at Fort Monza, had, after his return from the Zambezi expedition, made a successful tour to the boundary of the Mashukulumwe country, crossing the Kafue river, and then bearing north-north-east for seven days. During a two months' journey in this unexplored district he had taken observations for mapping purposes in addition to enrolling, organizing, and drilling the Barotse native police. His death, which was very sudden, was due to black-water fever. He was a useful and successful pioneer, and had become a *persona grata* with king Lewanika and the numerous indunas, and was doing most valuable work for the empire and in the cause of geography.

AMERICA.

The British Columbia-Yukon Boundary.—A survey has lately been carried out under the direction of the Surveyor-General of Canada of the country along the boundary-line between British Columbia and the Yukon territory, which is constituted by the 60th parallel of north latitude. Reports on a portion of the work (that between Lake Bennett and Teslin lake) by Messrs. St. Cyr and White-Fraser, appear in the Annual Report of the Department of the Interior for 1900, accompanied by a map. The district is exceedingly difficult to travel, being filled with mountain ranges trending north and south, separated by deep narrow valleys. These mountains, which branch off the main range separating the Pacific basin from that of the Yukon, have the barren wild appearance of the snow-clad peaks of the coast range. The highest point (6500 feet) in the section of the boundary under discussion lies between Windy arm and Taku arm, both branches of Tagish lake which connects with Lake Bennett at Caribou on the White pass and Yukon railway. East of Taku arm the country is densely wooded with spruce and pine, averaging 8 inches in diameter. A meridian through Atlin lake (some 12 miles east of Taku arm) would divide the district into two distinct conformations. West

of such a line the mountains are majestic rock masses, while to the east the hills form a rolling landscape, from which a great peak will only occasionally stand out. Along the whole line from Atlin lake to Teslin it is quite unusual to come across a ledge of rock, the hills being covered to their very tops with a drift deposit of granite and quartz pebbles. The summit of Dawson peak overlooking Teslin lake rises out of this deposit, however, and forms a majestic mass of jagged precipices. In protected gulches, raspberries, black and red currants, and various other berries were seen in great abundance, and in open places the nutritious bunch grass grows luxuriantly. The animal life is abundant, including various bears, moose, caribou, mountain sheep and goats, and many smaller animals, grouse, ducks and geese, and other birds, while the streams and lakes are full of fine fish. Mr. White-Fraser's remarks on the mosquitos are interesting from the point of view of the distribution of the pest. The shortness of the season (June to August) during which these insects are active, is made up for by their vigour and pertinacity during that time, the traveller being attacked by them in dense clouds. An occasional respite is enjoyed through the fact that the mosquito apparently requires a temperature above 39° Fahr., and as the summer night-temperature generally falls below that point, it gets benumbed and drops into the grass. The whole region would appear to be useless except for mining, and the probability of any finds east of the Atlin line is small. The timber is too small to be of much use, and, though hay might be put up for winter use, the country is unfitted for grazing. After mining ceases to be productive, the country will, in Mr. White-Fraser's opinion, lapse once more into an extensive hunting and trapping country.

POLAR REGIONS.

Return of Polar Expeditions.—The return to Sandefjord of the expedition under Captain Stökken, organized by the Duke of the Abruzzi for the purpose of searching for the three lost members of his polar expedition of 1899–1900, was reported on August 17. The southern coasts of Franz Josef Land had been examined without the discovery of any trace of the missing men or clue to their fate. A memorial was, as arranged for by the Duke, erected on Cape Flora. Another expedition, which has so far proved unsuccessful, is that of Captain Bauendahl, who sailed last autumn, it will be remembered, in a small vessel with very inadequate equipment, in the hopes of pushing north by the Franz Josef Land route. Captain Bauendahl wintered at Danes island, Spitsbergen. According to news received from Norwegian whalers, and published in *Petermanns Mitteilungen* (No. 7), Captain Bauendahl is sending his ship home, and proceeding to East Greenland in a boat with one companion only, in the hope of pushing northward by that route.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

The Geoid and the U.S. Coast and Geodetic Survey.—An arc of the parallel of 39° N. lat. has lately been measured in the United States (U.S. Coast and Geodetic Survey, "Special publication, No. 4," summarized in the January number of the *National Geographic Magazine*). It extends from Cape May on the Atlantic coast to Point Arena on the Pacific coast, passing over 48° 46′ of longitude, and measuring 2625 miles. The triangulation has been developed from ten base-lines with an aggregate length of 53½ miles, the longest or Yolo base being 10·9 miles long. Among the Rocky mountains many of the sides of the triangles have lengths exceeding 100 miles, and one attains to 183 miles. The altitude of some of the stations is very considerable, as, for instance, Pike's peak, 14,108 feet, and Mount Elbert, 14,421. Distributed over the arc, or near it,

are one hundred and nine latitude stations and seventy-three azimuth stations, and twenty-nine longitudes have been determined by telegraph. The deviation of the plumb-line in the mountainous region is very large—at Patmos Head station, 12″ to the north; at Colorado Springs, 25″ to the west; and at Genoa station, Nevada, 29″ to the west. These are obviously accounted for by the masses and position of the mountains. But even in level country the average deviation is about 2·5″, and must be ascribed to the continental attraction, and the calculations of the American geodesists show that for about four-sevenths of the arc from its eastern extremity the equipotential surface of the geoid approaches closely to that of Clarke, while for the remainder the curvature is nearer to that of Bessel's ellipsoid of revolution. Another arc extends from Calais, Maine, opposite the Canadian frontier, and runs obliquely across the States to New Orleans, having a length of 1623 miles. The difference of the latitudes of its extremities is 15° 1′, and the longitudes 22° 47′. It passes over the two highest points in the eastern States—Mount Washington, 6300 feet, and Mount Mitchell, 6687 feet. Thirty-six determinations of latitude, fourteen of longitude, and thirty-four of azimuths have been used in ascertaining the elements of the spheroid most closely coinciding with the actual figure of the Earth. The elements of Bessel's spheroid and of Clarke's of 1866, which was adopted by the Coast and Geodetic Survey in 1880, are as follows:—Bessel's spheroid (1841): Equatorial radius (a) in metres = 6,377,397; Polar semi-axis (b) = 6,356,079; $a - b$ = 21,318; polar compression $\left(\frac{a-b}{a}\right) = \frac{1}{299{\cdot}15 \pm 3{\cdot}15}$. Clarke's (1866): a = 6,378,206; b = 6,356,584; $a - b$ = 21,622; $\frac{a-b}{a} = \frac{1}{295}$. The results of the American calculations are, for the equatorial radius, 6,378,157 ± 90 metres, or only 49 metres less than Clarke's; and for the polar compression $\frac{1}{304{\cdot}5 \pm 1{\cdot}9}$, which ratio is nearer to that of Bessel, and gives the geoid a form more closely approaching to a sphere.

GENERAL.

The World's Timber Supply.—Although the question of the timber-supply of the future is one of which the importance has been urged by experts for a long time past, the subject has hitherto failed to attract sufficient attention for any practical outcome to result. There are signs, however, that public attention may be at last aroused to the necessity of action if the necessary timber-supply of the world is to be maintained. In France the subject was lately brought forward by M. Melard, Inspector of Forests, at Paris; while a careful examination of the question in the light of recent statistics was lately put before the Society of Arts by Dr. W. Schlich, the well-known Professor of Forestry at Cooper's Hill College (*J.S.A.*, March 1, 1901). Both of these writers have shown that it is within the bounds of possibility that an actual shortage in the production of timber may be experienced in the near future. Such is the increasing demand in the principal industrial countries of the world, that even were the present supply to remain constant, it would not by any means suffice for the requirements of the world but a few years hence. Taking first the countries of Europe, Dr. Schlich divides them into importing and exporting countries; the former category including, in descending order, Great Britain and Ireland, Germany, France, Belgium, Denmark, Italy, Spain, Holland, Switzerland, Portugal, Bulgaria, Greece, and Servia; the latter, Russia (with Finland), Sweden, Austria-Hungary (with Bosnia and Herzegovina), Norway, and Rumania. In Great Britain and Germany respectively, the average annual imports during the last five years have stood at

22 million pounds' worth and 14 million pounds' worth respectively, France coming third with only 3 million pounds' worth. In the case of the two first, the annual increase in the amount imported has been steadily rising of late. An examination of the state of affairs in the principal exporting countries of Europe leads to no very hopeful conclusions. These are summed up thus. The exports from Norway have already begun to fall off, while those of Austria-Hungary must soon follow suit. Sweden may increase her exports to a moderate extent, while Russia is at present a doubtful factor. The net deficit for Europe as a whole amounts to 2,600,000 tons, which is made good by the net export from non-European countries. Of these, the United States and Canada alone supply any appreciable amount, the other exporting countries supplying chiefly expensive hard woods which cannot fill the place of coniferous timber. Dr. Schlich shows that, though the recent increased demand has been met by the United States (Canada having actually diminished her export to Europe of late years), this increased rate of export cannot be maintained, in spite of the attention lately paid to forestry in that country. In fact, the United States must, like Austria, cease to be an exporting country within a limited number of years. Canada, on the other hand, is capable of an increased export if no time is lost in introducing a rational management of her forests. This, however, is an indispensable condition. Lastly, Dr. Schlich shows that, with all the forest wealth of our colonies, the British Empire as a whole imports now annually timber valued at close on £18,000,000, and strongly urges the need of a more vigorous forest policy throughout the empire. In the United Kingdom alone we have more than sufficient surplus land to produce the whole amount required, without touching existing woodlands or putting a single acre out of cultivation. But in order to ensure financial success, the provision of scientific instruction in forestry is, among other measures, urgently needed.

Pierre Garcie and his Works on Navigation.—An interesting account of Pierre Garcie, the author of one of the earliest books of sailing directions, is given in the *Bulletin de Géographie Historique et Descriptive* (1900, p. 135) by M. Auguste Pawlowski, who corrects certain mistakes into which bibliographers have fallen with respect to Garcie's works. In the first place, he shows that the earliest known edition of the 'Grand Routier' is that of Poitiers, printed by Enguilbert de Marnef in 1520. The statement of Sir Travers Twiss, in 'The Black book of the Admiralty' (1873), that the Bodleian possesses an edition of 1483, is inexplicable, inquiry having shown that the Bodleian edition is one of the last issued at Poitiers, probably about 1549. The 1520 edition has been supposed to have appeared during Garcie's lifetime, but M. Pawlowski considers it more probable that it was brought out by Marnef from Garcie's manuscripts. The most interesting fact brought out in the paper is perhaps that of the existence of a 'Petit Routier,' of which a single copy only is known (in the Bibliothèque Nationale at Paris), which internal evidence shows almost certainly to have been also the work of Garcie. Out of twenty-two chapters eight are reproduced almost verbally in the 'Grand Routier,' six others appear in the latter with modifications or additions, while eight only do not appear in the 'Grand Routier.' Their omission is attributed by M. Pawlowski to the use of an incomplete manuscript by Marnef, as the chapters all refer to countries familiar to Garcie during the course of his many voyages. The 'Petit Routier' also helps to clear up certain doubtful points respecting the 'Rôles d'Oléron,' the first code of maritime law current in the Atlantic during the middle ages, while another point of interest about it is the fact that it, and not the 'Grand Routier,' was the original of the 'Rutter of the Sea,' of which a copy (dated 1536) belongs to the Library of Lincoln's Inn.

M. Pawlowski considers it proved that Garcie was the only really original French writer on hydrography from the fifteenth to the close of the sixteenth century.

Natural versus Official Nomenclature in Mountain Districts.—M. de Martonne, whose recent studies in the Carpathians have more than once been referred to in the *Journal*, has a note in the *Bulletin de Géographie Historique et Descriptive* (1900, p. 83) on the mountain nomenclature in districts little affected by outside influence, as compared with that prevailing in ranges frequently visited by the tourist or surveyor. The former are not easily met with in Europe at the present day, but in the Southern Carpathians, sometimes known as the Transylvanian Alps, he found unusual facilities for studying the question, the fact that the northern versant of the range has been brought within the sphere of action of the Austrian Survey Department permitting the two styles of nomenclature to be observed side by side, with various grades of transition between them. On the unsophisticated southern slope, the following characteristic facts were noticed by the writer. Firstly, the place-names are very frequently adjectives, denoting a special physical peculiarity, and repeated again and again in very different regions. Examples of this are Zanoaga (a high cirque-like valley), Cheia (a narrow gorge), and many other names. Secondly, nearly all the other names are formed of generic expressions (*e.g.* Deal = height) compounded with names of men, animals, etc. Thirdly, the wealth of nomenclature is in inverse proportion to the complexity of the surface features, an extreme poverty of names being noted in the high mountain zone. This is due to the simplicity of social condition and scarcity of population in that zone. Fourthly, while we are accustomed to base the nomenclature on the *summits*, the peasants bestow names in the first instance on the *valleys*. Much confusion may arise from the failure to recognize this, a mountain crest having, as a rule, different names in the valleys which it separates. A similar state of things has often been recognized as existing in the Alps and elsewhere, the names now attached to mountain peaks having frequently been applied, originally, to the pastures below them used by the villagers in their neighbourhood.

Mountain Passes.—Miss Ellen Semple, whose interesting account of the dwellers in the Kentucky mountains appeared in the June number of the *Journal*, contributes to the *Bulletin* of the American Geographical Society (1901, No. 2) an excellent study in anthropogeography on the subject of Mountain passes. The paper begins with a general consideration of mountain ranges in their bearing on the history of the nations, the great differences observable in different ranges as regards facilities of intercourse between the two sides being pointed out. Thus the Hindu-Kush is instanced as an example of a range presenting open doors to the passage of invaders, while the Alps and the Appalachian system also allow fairly easy transit across them. The Caucasus and the Pyrenees present much more formidable barriers, and on this account the importance of the passes between the sea and one or both extremities of the range is enhanced. The peculiar character of the Pamirs has caused them to be a great highway from west to east from the earliest times. The four different kinds of passes distinguished by as many names by the Kirghiz, may, the writer thinks, serve as a basis for classifying passes in general. The almost complete break or dip in a mountain system is represented by the natural depression of the Hudson and Mohawk valleys, or the gap of Belfort between the Vosges and the Alps. Allied to this type in its low elevation, but differing in other respects, is the deep saddle by which an individual ridge is broken, such as the Brenner. Higher passes may be grouped together, though presenting many minor differences. Thus the summit of the Little St. Bernard is a pasturage plain, while the Brèche de Roland in the

Pyrenees is a portal only 300 feet wide. Quite as important as the pass or gap is the nature of the avenue of approach to the same, and this is, of course, determined by the general structure and relief of the range, the transverse valley of erosion affording the greatest facilities for communication. It is the flanking valleys of approach which draw to themselves all the active life of the mountains, while the passes themselves have only emergency inhabitants. Where no carriage route has been constructed over the summit, as is generally the case in the Pyrenees, a small settlement springs up where such road ends and the mule-path or foot-trail begins. Lower down the valley there will probably be a spot where side valleys converge, each perhaps itself leading to a pass, and this becomes necessarily a focus of life and trade. Such points are Chiavenna, Aosta, and Bellinzona. The paper, which is to be continued in a subsequent number, contains here and there statements which might be misleading. From the account of the ranges between India and Baluchistan it might be thought that they present little barrier to intercourse, while from the reference to Hannibal in connection with the Little St. Bernard it might be supposed that no doubt existed as to the pass used by the Carthaginian general.

Annual Report of the Russian Geographical Society.—We have just received the Annual Report of the Russian Geographical Society for the year 1900, which includes the belated reports of the Turkestan, East Siberia, Orenburg, and Amur branches of the Society for 1898 and 1899. During the past year the Society has sustained several heavy losses, by the death, among others, of Prof. V. V. Vasilieff, one of the best authorities on Buddhism in Europe, and the author of two capital works, 'Buddhism, its Dogmas, History, and Literature,' and 'Graphic System of Chinese Hieroglyphs;' of Prof. S. I. Korschinski, who was an excellent botanist, and after his numerous journeys in Russia, Siberia, and Turkestan had begun to prepare a 'Flora of Russia;' the ethnographer, L. N. Maïkoff; D. G. Anuchin, ex-Governor-General of East Siberia; and the meteorologist, F. F. Müller. Of expeditions, three were at work during the year: the "Tibet expedition" of Kozloff; the Korean and Sakhalin expedition under P. J. Schmidt; and the Kamchatka expedition, now under V. N. Tyushoff. Dr. N. A. Zarudnyi was also carrying on investigations in Persia, and a couple of small expeditions were at work in European Russia. Dr. Zarudnyi, author of an excellent zoo-geographical work, 'Oiseaux de la région Transcaspienne,' is continuing the same kind of work in Persia. Of the various publications in contemplation, we notice with great interest that D. N. Anuchin is about to publish the valuable observations of Miklukho-Maklay in the East Indies, Micronesia and Polynesia, which have been hitherto known by short abstracts only. The Constantine medal was awarded this year to the indefatigable explorer of Asia, V. A. Obrucheff. His work in the Transcaspian territory, then in the Olekma and Vitim highlands, and later on in East Mongolia, for which his explorations are epoch-making, are well known to the scientific world. His four years' work in Transbaikalia, in connection with the Siberian railway, is less known, but equally important, while his recent explorations on the coasts of the Pacific are only known as yet from short preliminary reports. The Lütke medal was awarded to M. E. Zhdanko for his hydrographical, magnetical, and geodetical work extending over several years; the Semenoff medal to J. A. Kersnovsky for meteorological work; and the Prjevalsky medal to V. V. Sapozhnikoff, professor at Tomsk university, who has explored the flora and the glaciers of the Altai, proving that glaciers are to be counted in the Altai by hundreds, and that the valleys of these highlands bear unmistakable traces of a former much greater extension of glaciers. The results of his three years' journeys are now embodied in a work entitled 'The

Katun River and its Sources,' with maps and a catalogue of heights and a summary in French. Small gold medals were awarded to N. A. Busch for the exploration of the glaciers and the botany of Northern Caucasia; to V. S. Moshkoff for ethnographical work; to P. Th. Unterberger for his work, 'The Maritime Province.' A number of silver and bronze medals were distributed for minor works. Of the various work done by the Turkestan branch of the Russian Geographical Society, we must mention the exploration of Central Asian lakes, including Lake Aral (mentioned *ante*, p. 86), and M. A. Kirchhoff's and P. K. Zalessky's surveys of the upper Panj, which give to it a position from 8′ to 9′ more to the west than on our present maps. As to L. S. Berg's exploration of Lake Aral, it proves that, although the lake was undoubtedly in a period of desiccation previously to 1880, it has certainly begun to decrease once more since that date, covering some of the recent islands. Its level must have been raised by full 7 feet within the last twenty years. In the work of the East Siberian branch, the exploration of the Munku-Sardyk peak and Lake Kossogol deserves special mention. The depth of the latter exceeds, in places, 70 fathoms. The biological station at Golöustnaya, on Lake Baikal, has unfortunately been closed for want of money, but extremely interesting collections of fishes (chiefly of the Cottus genus) and of crustaceans, have been made. The latter are now in Norway, in the hands of Dr. Sars.

OBITUARY.

Prince Henry of Orleans.

Prince Henry of Orleans, who by his daring journeys in Central and South-Eastern Asia had taken a foremost place amongst recent explorers of that continent, died at Saigon on August 9 from the results of an operation necessitated by abscess of the liver. The elder son of the Duc de Chartres, Prince Henry was born in 1867, and was thus little more than twenty years old when he undertook, in company with the well-known traveller M. Bonvalot, his first journey in Central Asia, which eventually led the explorers from north to south across some of the least-known portions of Tibet, bringing them at last to the shores of Tongking. The first expedition in which the prince proved his capacity as leader was that in which the least-known portions of the Indo-Chinese peninsula were for the first time crossed from east to west. In this journey, which the prince described in person before our Society in 1896, and afterwards in a thrilling narrative translated, soon after its appearance, into English, portions of the Mekong and Salwen, for the mapping of which we had to depend on the old survey carried out at the instance of the French Jesuits in the eighteenth century, were for the first time explored by a European; while by striking across the upper basin of the Irawadi to Assam, the expedition virtually set at rest the question of the sources of that river. Prince Henry had of late years become a mouthpiece of the advanced colonial party in France, and had thus been brought somewhat into antagonism with British interests, especially in Abyssinia, to which country he undertook an abortive expedition in connection with the De Bonchamps mission. It is, however, to his geographical work, which, as already shown, was of considerable importance, that we must confine our attention here.

Baron de Santa Ana Nery.

We regret to record the sudden death, which lately occurred at Paris, of our honorary corresponding member, Baron de Santa Ana Nery, known for his writings on matters relating to Brazil, of which country he was a native. Of these works perhaps the most important were, 'Le Pays des Amazones,' published in 1885, and afterwards translated into English; and 'Le Brésil en 1899,' a general account of the country published in connection with the Paris Exhibition of 1889, at which he represented his native land. He was also a delegate of the Geographical Society of Rio de Janeiro at the London meeting of the International Geographical Congress. The baron had for many years resided in Paris, where he acted as correspondent of the *Jornal de Commercio* of Rio de Janeiro.

F. W. W. Howell.

A regrettable accident was reported during August from Iceland, which resulted in the death of the well-known traveller Mr. Frederick W. Howell, who by his venturesome journeys has done more to add to our knowledge of the remoter parts of Iceland than any other Englishman. Mr. Howell, who resided formerly at Sutton Coldfield, and latterly at Handsworth, near Birmingham, made his first important journey in 1890, in which year, starting with three men from Svinafell, he reached a point on the ice-clad peak of Oræfa Jökull, 6100 feet above sea-level, or only some 150 feet below the summit, the complete conquest of the peak being only prevented by a violent snowstorm. Returning to the attack in 1891, he was this time successful, effecting on August 17 the first ascent of the mountain, which he subsequently described in the *Proceedings* of our Society in 1892. Mr. Howell created a second record in 1899 by crossing for the first time, in company with two young Oxford men, the great ridge of the Láng Jökull, with its vast ice-fields. He has since continued his explorations, and was at the time of his death, according to news received in this country early in August, crossing with guides the Heradovotz river, when his horse, becoming entangled in a quicksand, began plunging about. Mr. Howell was thrown from the saddle, and, being carried away by the strong current, was drowned. He had been a Fellow of our Society since 1891.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By EDWARD HEAWOOD, M.A., *Librarian*, R.G.S.

The following abbreviations of nouns and the adjectives derived from them are employed to indicate the source of articles from other publications. Geographical names are in each case written in full:—

A. = Academy, Academie, Akademie.
Abh. = Abhandlungen.
Ann. = Annals, Annales, Annalen.
B. = Bulletin, Bollettino, Boletim.
Com. = Commerce.
C. Rd. = Comptes Rendus.
Erdk. = Erdkunde.
G. = Geography, Geographie, Geografia.
Ges. = Gesellschaft.
I. = Institute, Institution.
Iz. = Izvestiya.
J. = Journal.
k. u. k. = kaiserlich und königlich.
M. = Mitteilungen.
Mag. = Magazine.
Mem. = Memoirs, Mémoires.
Met. = Meteorological.
P. = Proceedings.
R. = Royal.
Rev. = Review, Revue.
S. = Society, Société, Selskab.
Sitzb. = Sitzungsbericht.
T. = Transactions.
V. = Verein.
Verh. = Verhandlungen.
W. = Wissenschaft, and compounds.
Z. = Zeitschrift.
Zap. = Zapiski.

On account of the ambiguity of the words *octavo*, *quarto*, etc., the size of books in the list below is denoted by the length and breadth of the cover in inches to the nearest half-inch. The size of the *Journal* is 10 × 6½.

A selection of the works in this list will be noticed elsewhere in the "Journal."

EUROPE.

Alps. *Sitzb. A.W. Berlin* (1901): 170-185. **Salomon.**

Ueber neue geologische Aufnahmen in der östlichen Hälfte der Adamellogruppe. Von Prof. Dr. Wilhelm Salomon.

Ardennes. **Arçtowski.**

Quelques mots relatifs a l'étude du Relief de l'Ardenne et des directions que suivent les rivières dans cette contrée. Par Henryk Arçtowski. (Extrait du Bulletin de la Société Belge de Géologie, de Paléontologie et d'Hydrologie, tome ix., 1897.) Bruxelles, 1901. Size 9½ × 6½, pp. 118–127. *Sketch-maps.*

Austria—Bohemia. **Forbes.**

Sugar Industry of Bohemia. Foreign Office, Miscellaneous, No. 554. 1901. Size 9½ × 6, pp. 6. *Price* ½*d.*

Austria—Bosnia, etc. *Abh. G. Ges. Wien* **3** (1901), (No. 2): 1-86. **Cvijić.**

Morphologische und Glaciale studien aus Bosnien, der Hercegovina und Montenegro. II. Theil: Die Karstpoljen. Von Dr. Jovan Cvijić. *With Map.*

Austria—Canals. *Questions Dipl. et Colon.* **12** (1901): 14-28. **Daurys.**

La question des canaux en Autriche. Par Henri Daurys. *With Map and Diagram.*

Austria—Earthquakes. *Sitzb. K.A.W. Wien* **108** (Ab. I.) (1899): 33-226. **Mojsisovics.**

Mittheilungen der Erdbeben-Commission der kaiserlichen Akademie der Wissenschaften in Wien. X. Allgemeiner Bericht und Chronik der im Jahre 1898 innerhalb des Beobachtungsgebietes erfolgten Erdbeben zusammengestellt von Dr. Edmund v. Mojsisovics.

Austria—Karlseisfeld. *Abh. G. Ges. Wien* **3** (1901): 1-25. **Hübl.**

Karlseisfeld-Forschungen der K. K. Geographischen Gesellschaft. I. Theil. Die Topographische Aufnahme des Karlseisfeldes in den Jahren 1899 und 1900. Von Arthur Freiherrn von Hübl. *With Maps and Plate.*

Austria—Trieste. **Churchill.**

Trade of Trieste for the year 1900. Foreign Office, Annual No. 2583, 1901. Size 9½ × 6, pp. 22. *Price* 1½*d.*

Europe—Geodesy. ——

Veröffentlichung des Königl. Preussischen Geodätischen Institutes. N.F. No. 5. Astronomisch-Geodätische Arbeiten I. Ordnung. Bestimmung der Längendifferenz, Potsdam-Bukarest, im Jahre 1900. Berlin: P. Stankiewicz, 1901. Size 11½ × 9, pp. iv. and 56.

Faroe Islands. **Villiers.**

The Faroe Islands. Foreign Office, Annual No. 2589. 1901. Size 9½ × 6, pp. 16. *Price* 1*d.*

France. **Leitritz.**

La France. Anthologie Géographique. Zum Schulgebrauch herausgegeben von Johannes Leitritz. Zweite Auflage. Leipzig: Rengersche Buchhandlung, Gebhardt und Wilisch, 1901. Size 7½ × 5, pp. xii. and 244. *Map and Illustrations. Presented by the Editor.*

The writer has brought together from a variety of sources information on the geography of France, with illustrations of the national character, manners, etc., of the French, the phraseology and style of the original writers being as far as possible preserved. The present edition has been subjected to extensive revision.

France. *B.S.G. Com. Paris* **22** (1900): 481–504. **Levasseur.**

Géographie Industrielle de la France en 1789. Par M. Émile Levasseur.

France—Chamonix. **Whymper.**

Chamonix and the Range of Mont Blanc. A Guide by Edward Whymper. Sixth Edition. London: John Murray, 1901. Size 7½ × 5, pp. xiv. and 206. *Maps and Illustrations. Price* 3*s. net. Presented by the Author.*

Visitors to the Alps will welcome the appearance of a new edition of this excellent guide.

France—Paris. **Joanne.**

Collection des Guides-Joanne. Paris, ses Environs et un Appendice sur l'Exposition de 1900. Par Paul Joanne. Paris: Hachette et Cie, 1900. Size 6½ × 4, pp. lxxxiv. 344, 24, 48, 32. *Plans. Presented by Dr. J. S. Keltie.*

France—Puy-de-Dôme. **Boule and others.**

Le Puy-de-Dôme et Vichy. Guide du Touriste, du Naturaliste et de l'Archéologue. Par Marcellin Boule, l'hilippe Glangeaud, Gilbert Rouchon, Antoine Vernière. Paris: Masson et Cie, 1901. Size 7½ × 4½, pp. iv. and 378. *Maps and Illustrations. Presented by Dr. M. Boule.*

This is the third issue of an excellent series of guides to districts of France, edited by M. Boule. It does not appeal only to the tourist, but contains much interesting information on the history, physical geography, resources, etc., of the district.

France and Germany—Railways. *B.S.G. Com. Havre* **18** (1901): 257–274. **Sorel.**

Comment les chemins de fer français facilitent la décentralisation, comparaison avec les chemins de fer allemands. Par M. le Dr. Robert Sorel.

Germany. *Sitzb. A.W. Berlin* (1901): 501–523. **Branco and Traas.**

Beweis für die Richtigkeit unserer Erklärung des vulcanischen Ries bei Nördlingen. Von W. Branco und Prof. Dr. E. Traas.

The authors defend their views as to the volcanic origin of certain features in the "Ries" district from the criticism of Dr. Koken.

Germany. *G.M. Hessen*, I. and II. Heft (1900): 5–102. **Krausmüller.**

Die Volksdichte der Grossherzogl. Hessischen Provinz Oberhessen. Von Dr. Georg Krausmüller.

Germany—Pomerania. *Verh. Ges. Erdk. Berlin* **28** (1901): 232–240. **Halbfass.**

Ergebnisse seiner Seenforschung in Pommern. Von Dr. W. Halbfass.

Germany—Prussia. *Questions Dipl. et Colon.* **11** (1901): 707–722. **Pasquier.**

La question des canaux en Prusse. Par H. Pasquier. *With Map.*

Germany—Rhine Province. *Meteorolog. Z.* **18** (1901): 97–106. **Polis.**

Beiträge zur Gewitterkunde im Hohen Venn und der Eifel. Von Dr. P. Polis. *With Map.*

Germany—Saxony. ———

Zeitschrift des K. Sächsischen Statistischen Büreaus 46 Jahrgang 1900, Heft 3 und 4. Dresden. Size 11½ × 9, pp. 117–240.

Holland. **Schuiling.**

Tijds. K. Ned. Aard. Genoots. Amsterdam **18** (1901): 153–198, 319–342.

De grenzen van de provincie Overijsel en hare landschappen. Door R. Schuiling. *With Map.*

Iceland. *Travel* **6** (1901): 99–104. **Thiele.**

Through Iceland on a Side Saddle. By L. F. K. von Thiele. *With Illustrations.*

On a tour through Iceland with the late Mr. Howell as conductor.

Italy. **Morgan.**

Trade, Commerce, and Agriculture of Italy for the year 1900. Foreign Office, Annual No. 2616, 1901. Size 10 × 6, pp. 34. *Price* 2½*d.*

Italy. *Ann. G.* **10** (1901): 225–231. **Mori.**

La Carte d'Italie. Par M. A. Mori.

The new topographic map of Italy, executed by the Military Geographic Institute, was completed last year, as far as field work is concerned, by the survey of the central part of Sardinia.

Italy—Agriculture. *Ric. G. Italiana* **8** (1901): 272–279. **Marinelli.**

La Geografia e la Carta Agronomica d'Italia. Per Olinto Marinelli.

Urges Italian geographers to co-operate in the scheme for an agricultural map of the kingdom.

Italy—Geodesy. *Atti R.A. Lincei Rendiconti* **10** (1901): 284–291. **Reina.**

Determinazione astronomica di latitudine eseguita a Monte Soratte nel 1900. Nota di Vincenzo Reina.

Italy—Lombardy. **Armstrong.**
Agriculture and Trade of Lombardy for the year 1900. Foreign Office, Annual No. 2597, 1901. Size 9½ × 6, pp. 10. *Price* 1*d.*

Italy—Monte Soratte. *Atti R.A. Lincei, Rendiconti* **10** (1901): 346–351. **Reina.**
Determinazione astronomica di azimut esequita a Monte Soratte nel 1900. Nota di Vincenzo Reina.

Italy—Place-names. *Riv. G. Italiana* **8** (1901): 261–271. **Grasso.**
Sul cambiamento di nome nei Comuni attuali d'Italia. Appunti di Gabriele Grasso.

Mediterranean—Cyprus. *J. Anthrop. I.* **30** (1900): 199–220. **Evans.**
Mycenæan Cyprus as illustrated in the British Museum Excavations. By A. J. Evans. *With Illustrations.*

Norway. *Quarterly J.R. Meteorolog. S.* **27** (1901): 105–115. **Williams.**
The Climate of Norway and its Factors. By C. Theodore Williams, M.D. *Maps.*

Rumania. *C. Rd.* **132** (1901): 1140–1143. **Martonne.**
Sur les mouvements du sol et la formation des vallées en Valachie. Note de M. E. de Martonne.
A note on this has appeared in the Monthly Record (*ante*, p. 210).

Russia—Baltic Provinces. *Deutsche Rundschau G.* **23** (1901): 342–349. **Zweck.**
Bilder von der russischen Grenze. Von Dr. Albert Zweck. *With Illustrations.*

Russia—Don Cossacks. *Oester. Monats. Orient* **27** (1901): 26–29. ——
Die wirthschaftliche und culturelle Lage der Don 'schen Kosaken.

Russia—Meteorology. *Meteorolog. Z.* **18** (1901): 216–223. **Heintz.**
Meber Niederschlagsschwankungen in den Flussgebieten der Wolga, des Dnjepr und des Don während der Periode 1861–1898. Von E. Heintz.

Russia—Poland. **Murray.**
Trade and Agriculture of Poland and Lithuania for the year 1900. Foreign Office, Annual No. 2578, 1901. Size 9½ × 6, pp. 80. *Price* 4*d.*

Scandinavia. *Geolog. Mag.* **8** (1901): 205–216. **Holst.**
The Glacial Period and Oscillation of Land in Scandinavia. By Dr. Nils Olof Holst. Translated by F. A. Bather, D.SC.

Spain. *Globus* **80** (1901): 1–3. **Rzehak.**
Eine Fahrt durch das Becken von Guadix. Von Granada nach Baza. Von Prof. A. Rzehak. *With Illustration.*

Spain—Montserrat. *B.S.R.G. d'Anvers* **25** (1901): 244–256. **Richet.**
Au Montserrat. Par M. Etienne Richet.

States of Europe. **Payart.**
Les Concordances de la Géographie Physique avec le groupement logique, politique, et commercial des États Européens. Communication faite au VII^me^ Congrès International de Géographie à Berlin en 1899. Par E. Payart. Berlin, 1900. Size 10 × 6½, pp. [10].

Sweden. *Ymer* **21** (1901): 113–144. **Lönborg.**
Geografiska och kartografiska arbeten i Sverige under 1600 = talet. Af Sven Lönborg.

Sweden. **MacGregor.**
Trade of Stockholm and Eastern Coast of Sweden for the year 1900. Foreign Office, Annual No. 2590, 1901. Size 9½ × 6, pp. 50. *Price* 3*d.*

Switzerland. *Vierteljahrs. Naturforsch. Ges. Zürich* **45** (1900): 59–136. **Amberg.**
Beiträge zur Biologie des Katzensees. Von Otto Amberg. *With Diagrams.*
Includes an account of the hydrography, geology, etc., of the Katzensee, a small lake to the north of Zürich.

Switzerland. *Vierteljahrs. Naturforsch. Ges. Zürich* **45** (1900): 164–182. **Heim.**
Der Schlammabsatz am Grunde des Vierwald-stättersee. Von A. Heim.
An important paper on the microscopical and chemical examination of specimens of mud from the Lake of Lucerne.

Switzerland. *Vierteljahrs. Naturforsch. Ges. Zürich* **45** (1900): 277–350. **Waldvogel.**

Der Lützelsee und das Lautikerried, ein Beitrag zur Landeskunde. Von T. Waldvogel. *With Map and Plate.*

An elaborate study of the Lützelsee in Canton Zürich, and its biology, as well as of the conditions of vegetation in the surrounding region.

Switzerland—Zermatt. **Whymper.**

The Valley of Zermatt and the Matterhorn. A Guide by Edward Whymper. Fifth Edition. London: John Murray, 1901. Size 7½ × 5, pp. xiv. and 224. *Maps and Illustrations. Price* 3*s. net. Presented by the Author.*

The merits of Mr. Whymper's Alpine guides are too well known to need being dwelt upon.

Turkish Empire. **Aldinger.**

Beiträge Kolonialpolitik u. Kolonialwirtschaft **2** (1900–1901): 545–546.

Türkische Wanderung und Auswanderung von Rumänien nach Kleinasien. Von Dr. Aldinger.

United Kingdom. *T. and Ninth Annual Rep. Liverpool G.S.* (1900): 71–122. **Nevins.**

The Voyages of the Early Celts to and from the British Isles. By J. Birkbeck Nevins, M.D. *With Maps and Illustrations.*

United Kingdom. *Quarterly J.R. Meteorolog. S.* **27** (1901): 117–140. **Mawley.**

Report on the Phenological Observations for 1900. By Edward Mawley. *Map.*

United Kingdom—Bristol. **Taylor.**

Some of the Public Institutions of Bristol. By L. Acland Taylor. A Paper read before the Library Association, Bristol, September 25, 1900. Bristol: J. W. Arrowsmith, 1900. Size 8½ × 5½, pp. 20. *Presented by the Bristol Museum and Reference Library.*

United Kingdom—Coal. *J.S. Arts* **49** (1901): 549–568. **Bellairs.**

The Coal Problem: its Relations to the Empire. By Lieut. Carlyon W. Bellairs.

United Kingdom—Ireland. *Aarb. Nord. Oldk. Hist.* **15** (1900): 279–332. **Bugge.**

Nordisk Sprog og nordisk Nationalitet i Irland. Af Alexander Bugge.

United Kingdom—Lake District. *Quarterly J. Geolog. S.* **57** (1901): 189–197. **Oldham.**

On the Origin of the Dunmail Raise (Lake District). By R. D. Oldham.

A note on this paper was given in the *Journal*, vol. xvii. p. 300.

United Kingdom—Scotland. **Smith, Paterson, and Watt.**

The Natural History of Ailsa Craig. By John Smith, John Paterson, and Hugh Boyd Watt. (Reprinted from *Annals of the Andersonian Naturalists Society*, vol. ii. part ii. Glasgow, 1900.) Size 9 × 6, pp. 135–154. *Presented by J. Smith. Esq.*

United Kingdom—Yorkshire. **Reed.**

The Geological History of the Rivers of East Yorkshire. Being the Sedgwick Prize Essay for the year 1900. By F. R. Cowper Reed. London: C. J. Clay & Sons, 1901. Size 9 × 6, pp. viii. and 104. *Map and Diagrams. Presented by the Author.*

This was noticed in the Monthly Record for August (*ante*, p. 209).

ASIA.

China. *Questions Dipl. et Colon.* **11** (1901): 663–673. **Fauvel.**

Les voies navigables de la Chine. Par A. A. Fauvel. *With Map.*

China. **Levasseur.**

Chine et Europe. Par E. Levasseur. (From 'Les Entretiens économiques et financiers,' V. Année No. 87, 4 Juin 1901.) Size 13 × 10, pp. 813–816.

China. *B. Comité l'Asie Française* **1** (1901): 59–65. **Madrolle.**

Le Kouang-tchéou-ouan: sa zone d'action. Par A. Madrolle. *With Map.*

On the French concession in Southern China.

China. *B.S.G. Com. Paris* **23** (1901): 92–118. **Vissière.**

Une visite à l'ancienne capitale du Manzi (Chine méridionale). Par A. Vissière. *With Sketch-map.*

On a journey from Shanghai to Hang-chau by water, and back by the Tien-mu mountains.

China. *Army Medical Dep. Rep.*, 1899, **41** (1901): 502–515. ———

Records of temperature, barometer, and rainfall, Lui Kung Tao, Wei-Hai-Wei, from August 10th, 1898, to August 9th, 1899.

China—Ichang. **Holland.**

Trade of Ichang for the year 1900. Foreign Office, Annual No. 2619. 1901. Size 9½ × 6, pp 8. *Price* ½*d.*

China—Trade. ———

China. Imperial Maritime Customs. 1. Statistical Series, Nos. 3 and 4. Returns of Trade and Trade Reports for the year 1900. Part I. Report on the Trade of China, and Abstract of Statistics. Shanghai, 1901. Size 11 × 8½, pp. 40. *Presented by the Inspector-General of Chinese Customs.*

China—Yunnan. *B.S.G. Com. Paris* **23** (1901): 142–154. **Leclère.**

Ressources minières du Yunnan. Par A. Leclère.

Dutch East Indies. **Colenbrander.**

Dagh-Register gehouden in Casteel Batavia van passerende daer ter plaetse als over geheel Nederlandts-India. Anno 1637. (Pp. viii. and 306.) Ditto. Anno 1641–1642. Mitgegeven door het Departement van Koloniën onder toezicht van Dr. H. T. Colenbrander. 'S-Gravenhage, M. Nijhoff, 1899–1900. Size 11 × 7½, pp. vi. and 324.

Dutch East Indies. ———

Register op de eerste 50 Deelen (1853–1899) van de "Bijdragen tot de Taal-, Land-, en volkenkunde Van Nederlandsch-Indië," uitgegeven door het Koninklijk Instituut voor de Taal-, Land-, en volkenkunde van Ned.-Indië, ter gelegenheid van zijn 50-jarig bestaan op 4 Juni 1901. 'S-Gravenhage, M. Nijhoff, 1901. Size 10 × 6½, pp. xx. and 120.

French Indo-China. **Tremlett.**

Trade of French Indo-China for the year 1900. Foreign Office, Annual No. 2618. 1901. Size 9½ × 6, pp. 26. *Price* 2*d.*

India. *B.S.G. Com. Paris* **22** (1900): 535–546. **Klobukowski.**

Le Kachemire, les provinces du Nord-Ouest et d'Oudh, le Punjab. Par M. Klobukowski.

India. *J. Asiatic S. Bengal* **69** (Pt. ii.) (1900): 457–476. **Rogers.**

The Relationship of the Water-Supply, Water-Logging, and the distribution of *Anopheles* Mosquitos respectively, to the prevalence of Malaria north of Calcutta. By Leonard Rogers.

The result of researches near Calcutta has been to show that prevalence of malaria does not necessarily characterize water-logged areas, even where malaria-bearing mosquitoes abound, but that a pure water-supply is an important prophylactic.

India. ———

Area and Yield of Certain Crops from 1891–92 to 1899–1900. Calcutta, 1900. Size 13½ × 8½, pp. 28.

India. *Scottish G. Mag.* **17** (1901): 225–239. **Holdich.**

Railway Connection with India. By Sir Thomas H. Holdich.

India. ———

Report on the Kodaikanal and Madras Observatories for 1899–1900. Size 13½ × 8½, pp. 18.

India—Assam. ———

Report on Tea Culture in Assam for the year 1899. Shillong, 1900. Size 13 × 8, pp. 8. *Map.*

The year 1899 was particularly favourable for tea, and the outturn showed an increase of 16·7 per cent.

India—Burma. *Scottish G. Mag.* **17** (1901): 239–265. **Cadell.**

A Sail down the Irrawaddy. By Henry M. Cadell. *With Illustrations.*

India—Historical. *J.S. Arts* **49** (1901): 417–431. **Holdich.**

The Greek Retreat from India. By Colonel Sir T. H. Holdich, C.B., etc. *Map.*

Sir T. Holdich examines Arrian's account of Alexander's retreat from India to Persia, in the light of modern knowledge of Southern Baluchistan.

India—Historical. *J. United Service I. India* **30** (1901): 93-116. **Burton.**

The Last Maratha War. By Captain R. G. Burton. *Map, Plan, and Illustration.*

India—Historical. **M'Crindle.**

Ancient India as described in Classical Literature. Being a collection of Greek and Latin Texts relating to India, extracted from Herodotus, Strabo, Diodorus Siculus, Pliny, Ælian, Philostratus, Dion Chrysostom, Porphyry, Stobaeus, the Itinerary of Alexander the Great, the Periēgēsis of Dionysius, the Dionysiaka of Nonnus, the Romance History of Alexander, and other works. Translated and copiously annotated by J. W. M'Crindle, M.A., LL.D. With Introduction and Copious Index. London: A Constable & Co., 1901. Size 9 × 6, pp. xxii. and 226. *Price 7s. 6d. net. Presented by the Publishers.*

This will be noticed elsewhere in the *Journal*.

India—Kashmir. *P. Zoolog. S.* (1901) I.: 91-94. **Lydekker.**

Note on the Kashmir Ibex (*Capra sibirica sacin*). By R. Lydekker. *With Plate.*

India—Languages. ——

Census of India, 1901. Indexes of Languages. London: Printed by Eyre & Spottiswoode, 1901. Size 9½ × 6, pp. 106.

These indexes, which are both alphabetical and classified, are based on the preliminary results of the Linguistic Survey of India.

India—Madras. *Mem. Geolog. Surv. India* **30** (1900): 103-168. **Holland.**

Geology of the neighbourhood of Salem, Madras Presidency, with special reference to Leschenault de la Tour's observations. By Thomas H. Holland. *With Map and Plate.*

An appendix gives extracts from papers by Leschenault de la Tour on geological observations made during his travels (1816-20).

India—Madras. *Indian Antiquary* **29** (1900): 347-350, 378-382. **Temple.**

Some original Documents relating to the taking of Madras in 1746 by La Bourdonnais. By R. C. Temple.

India—Madras. ——

Report on the Administration of the Madras Presidency during the year 1899-1900. Madras, 1900. Size 13½ × 8½, pp. xvi., 44, 242, and ccxiv. *Maps and Diagrams.*

Includes statistical returns on trade, industries, agriculture, etc., etc.

India—Marine Survey. ——

Administration Report of the Marine Survey of India for the official year 1899-1900. Bombay, 1901. Size 13½ × 8½, pp. 4. *Presented by the Survey.*

Among the operations of the year was the running of a meridian distance between Port Blair and Diamond Island, which, in conjunction with two previously run, prove Port Blair to be 1¼ miles east of the hitherto accepted position.

India—N.-W. Provinces and Oudh. ——

Report on the Administration of the N.-W. Provinces and Oudh for the year ending 31st March, 1900. Allahabad, 1901. Size 13½ × 8½, pp. iv., xliv., 206, iv., and 200.

Indo-China. *B. Comité l'Asie Française* **1** (1901): 52-56. **Mourey.**

Les chemins de fer de l'Indo-Chine. Par Charles Mourey. *With Map.*

Japan. **Lay**

Trade of Japan for the year 1900. Foreign Office, Annual No. 2595, 1901. Size 10 × 6, pp. 42. *Price 2½d.*

Japan. *B.S.G. Com. Havre* **17** (1900): 219-240. **Siegfried.**

Le développement économique et social du Japon. Par M. André Siegfried.

Japan—Formosa. **Yamasaki.**

Ein Besuch in den Kopʻjägerdörfern auf Formosa. Von Dr. N. Yamasaki. (Sonderabdruck aus Band xxxi. [der Dritten Folge Band I.] der "Mittheilungen der Anthropologischen Gesellschaft in Wien"). Wien, 1901. Size 11½ × 8, pp. 23-38. *Illustrations. Presented by the Author.*

Malay Archipelago—Celebes. *Globus* **80** (1901): 5-6. **Kobelt.**

Die zoogeographische Stellung von Celebes. Von Dr. W. Kobelt. *Sketch-maps.*

Malay Archipelago—Nias. **Van der Kemp.**

Bijd. Taal-, Land- en Volkenk. Nederland.-Indië **8** (1901): 584–603.

Raffles' betrekkingen met Nias in 1820–1821. Door P. H. van der Kemp.

Malay Peninsula—Malacca. **Schmidt.**

Bijd. Taal-, Land- en Volkenk. Nederland.-Indië **8** (1901): 399–583.

Die Sprachen der Sakei und Semang auf Malacca und ihr Verhältnis zu den Mon-Khmêr-Sprachen. Door P. W. Schmidt.

Malay States. **Swettenham.**

Annual Report for the year 1899 on the Federated Malay States. By the Resident-General (Sir F. A. Swettenham, K.C.M.G.), Kuala Lumpur, 1900. Size 13½ × 8½, pp. 6.

The revenue rose from 9 million dollars in 1898 to 13 million in 1899, mainly owing to the high price of tin.

Northern and Central Asia. *Quarterly J. Geolog. S.* **57** (1901): 244–250. **Wright.**

Recent Geological changes in Northern and Central Asia. By Prof. G. F. Wright.

A note on this paper appears elsewhere in the *Journal* (*ante*, p. 212).

Persia. *P.R. Artillery I.* **27** (1901): 683–690. **Wyatt.**

The Western Glacis of India. By Captain F. O. Wyatt. *With Map.*

Continuation of a narrative commenced early last year. The present instalment deals with the journey from Duruksh in the Kain district to Kerman.

Philippine Islands. **Coronas.**

Observatorio de Manila. El Baguio del 8 de Septiembre, 1900. Por el P. José Coronas, S.J. Manila, 1900. Size 12½ × 9, pp. 36. *Diagrams.*

This typhoon was the most violent that had occurred since 1896.

Russia—Caucasus. *Die Natur* **50** (1901): 220–222, 229–231. **Rossmässler.**

Die Volksstämme Kaukasiens. Von F. A. Rossmässler.

Russia—Sakhalin. *B.S.G. Com. Paris* **23** (1901): 119–125. **Labbé.**

L'île de Sakhaline. Par Paul Labbé.

On a mission carried out for the French Ministry of Public Instruction.

Russia—Siberia. **Bogdanovich and Diener.**

Sitzb. A.W. Wien **109** (Ab. I.), (1900): 349–369.

Ein Beitrag zur Geologie der Westküste des Ochotskischen Meeres. Von K. Bogdanowitsch und C. Diener. *With Plate.*

Russia—Siberia. *B.S.G. Com. Paris* **22** (1900): 281–293. **Aulagnon.**

La Sibérie occidentale et centrale. Par M. C. Aulagnon. *With Map.*

Gives the results of a study on the spot of economic conditions in Western and Central Siberia.

Russia and Persia. *B.S.G. Com. Paris* **22** (1900): 245–266. **Grillières.**

Voyage en Russie et en Perse, partie anecdotique et pittoresque. Par M. le Lieut. Grillières. *With Illustrations.*

The route led *viâ* Askabad and Meshed to Teheran.

Turkey—Aleppo. **Barnham.**

Trade of Vilayet of Aleppo for the year 1900. Foreign Office, Annual No. 2587, 1901. Size 9½ × 6, pp. 18. *Price* 1½*d.*

Turkey—Asia Minor. *J. Anthrop. I.* **30** (1900): 305–320. **Crowfoot.**

Survivals among the Kappadokian Kizilbash (Bektash). By J. W. Crowfoot. *With Map and Plates.*

The writer paid visits in 1900 to some little-known Kizilbash villages near the eastern bank of the Halys.

Turkey—Palestine. **Dickson.**

Trade of Palestine for the year 1900. Foreign Office, Annual No. 2584, 1801. Size 9½ × 6, pp. 10. *Price* 1*d.*

Turkey—Palestine. **Reynolds-Ball.**

Jerusalem. A practical guide to Jerusalem and its Environs, with excursions to Bethlehem, Hebron, Jericho, the Dead sea, and the Jordan, Nablous, Nazareth,

Beirût, Baalbek, Damascus, etc. By E. A. Reynolds-Ball, B.A. London: A. & C. Black, 1901. Size 7 × 4½, pp. viii. and 230. *Plan, Maps, and Illustrations. Price 2s. 6d. Presented by the Publishers.*

This guide, by the author of 'Cairo of To-day,' should prove of much value to travellers in the Holy Land. It is well arranged, and contains a large amount of practical information.

Turkey—Palestine—Ancient Map. **Beazley.**

Madaba map. By C. Raymond Beazley. (From the *Geographical Journal* for May, 1901.) Size 10 × 6½, pp. 6.

Turkey—Railway. *Deutsche Rundschau G.* **23** (1901): 337–342. **Hermann.**

Die beschränkte Bedeutung der Bagdadbahn und ihre Gefahr. Von Dr. R. Hermann. *With Map.*

Turkey—Railway. *B. Comité l'Asie Française* **1** (1901): 23–28. **Peyerimhoff.**

Le Chemin de fer de Bagdad. Par M. Henri de Peyerimhoff. *With Map.*

A useful summary of railway projects in Asiatic Turkey.

Turkey—Trebizond and Sivas. **Longworth and Anderson.**

Trade of the Vilayets of Trebizond and Sivas for the year 1900. Foreign Office, Annual No. 2588, 1901. Size 9½ × 6, pp. 38. *Price 2½d.*

AFRICA.

Ascension Island. *Nautical Mag.* **70** (1901): 339–350. **Lord.**

Ascension Island. By W. B. Lord.

Ashanti. **Armitage and Montanaro.**

The Ashanti Campaign of 1900. By Captain C. H. Armitage and Lieut.-Colonel A. F. Montanaro. London: Sands & Co., 1901. Size 9 × 6, pp. viii. and 278. *Map, Plan, and Illustrations. Price 7s. 6d. Presented by the Publishers.*

This is the fullest and in many ways the best account which has appeared of the recent Ashanti campaign. The map, by Stanford, is on the scale of 4 miles to the inch, and permits most of the operations to be followed with ease.

Azores. *Ann. Hydrographie* **29** (1901): 243–253. ——

Die Noth- und Orderhäfen der Azoren. Nach Berichten der Kaiserlichen Konsulate daselbst, des Kommandos S.M.S. *Moltke* und des Kapt. F. W. Thöm, Schiff *Ostara*, ergänzt aus deutschen, englischen und portugiesischen Quellen. *Plans.*

Azores—Cartography. *B.S.G. Lisboa* **17** (1898–99): 455–477. **Mees.**

Les Açores d'après les Portulans. Pelo dr. Jules Mees.

An interesting study of the development of the cartography of the Azores during the middle ages.

Basutoland. *J.R. Colonial I.* **32** (1901): 452–480. **Lagden.**

Basutoland and the Basutos. By Sir Godfrey Lagden, K.C.M.G.

British Central Africa. **Vyvyan.**

Précis of Information concerning the British Central Africa Protectorate, with Notes on Adjoining Territories. Compiled by Major C. B. Vyvyan, February, 1899. London: Eyre & Spottiswoode, 1899. Size 9½ × 6, pp. 54. *Maps. Price 3s. 6d. Presented by the Intelligence Division, War Office.*

British South Africa. **Gibbons and Quicke.**

Explorations in Marotseland and Neighbouring Regions. By Major A. St. Hill Gibbons. Supplementary Journeys, by Captain F. C. Quicke. (From the *Geographical Journal* for February, 1901). Size 10 × 6½, pp. 30. *Maps and Illustrations.*

British South Africa. **Grey.**

The Kafue River and its Headwaters. By George Grey. (From the *Geographical Journal* for July, 1901). Size 10 × 6½, pp. 16. *Map.*

Central Africa. *P. Zoolog. S.* (1901) I.: 50–52. **Sclater.**

On an apparently new Species of Zebra from the Semliki Forest. By P. L. Sclater, F.R.S. *With Illustrations.*

This account of the new mammal brought to light by Sir H. Johnston, is based on the fragments of skin first procured.

East Africa. *J. Anthrop. I.* **30** (1900): 275–297. **Hollis.**

Notes on the History of Vumba, East Africa. By A. C. Hollis. *With Maps.*

The author has written down the traditions and folk-lore of the Vumba district on the southern border of British East Africa, from the accounts of aged inhabitants. Many important documents on the history of the place in early Arab times were destroyed during the rebellion of Mbaruk in 1895.

Egypt. **Brodrick.**

A Handbook for Travellers in Lower and Upper Egypt, including descriptions of the course of the Nile through Egypt and Nubia, Alexandria, Cairo, the Pyramids, Thebes, the First and Second Cataracts to Khartûm, the Suez Canal, the Peninsula of Mount Sinai, the Oases, the Fayyûm, etc. Tenth edition, revised. Edited by Mary Brodrick, PH.D. London: John Murray, 1900. Size 7 × 4½, pp. 16 and 1006. *Maps and Plans. Price* 15*s. Presented by the Publisher.*

The ninth edition, which appeared in 1891, and was itself entirely rewritten, has now been carefully revised and brought up to date.

Egypt. **Cromer.**

Egypt. No. 1 (1901). Reports by His Majesty's Agent and Consul-General on the Finances, Administration, and Condition of Egypt and the Soudan in 1900. London: Eyre & Spottiswoode, 1901. Size 13 × 8½, pp. iv. and 86. *Price* 9*d.*

This report will be specially noticed.

Egypt. *Cosmos* **13** (1901): 40–44. **Nallino.**

La Descrizione dell' Egitto di 'Umar ibn Muhammad al-Kindî, pubblicata da J. Oestrup. Cenni critici del Prof. dott. C. A. Nallino.

Dr. Oestrup published a version of the description of Egypt by Ibn Muhammad al-Kindi (tenth century) in 1896 at Copenhagen.

Egypt. ———

Ministry of Public Works. A List of Publications, Maps, and Plans published by the Public Works Ministry up to December 31, 1900. Cairo, 1901. Size 9½ × 6½, pp. 22.

Egypt—Farafra Oasis. **Beadnell.**

Survey Department, Public Works Ministry. Geological Survey Report, 1899. Part iii. Farafra Oasis: its Topography and Geology. By Hugh J. L. Beadnell, Cairo, 1901. Size 11 × 7½, pp. 40. *Maps and Sections.*

Egypt—Sinai. *Geolog. Mag.* **8** (1901): 198–204. **Hume.**

The Rift Valleys of Eastern Sinai. Geology of Eastern Sinai. By W. F. Hume, D.SC.

A note on this paper has appeared in the Monthly Record (*ante*, p. 211).

Egypt—Sudan. **Dujarric.**

Gaston Dujarric. L'État Mahdiste du Soudan. Préface par Henri Pensa. Paris: J. Maisonneuve, 1901. Size 9 × 5½, pp. iv. and 314. *Price* 6*s.* 6*d.*

A historical sketch of the rise and fall of the Mahdist power. The writer attempts in a measured way to vindicate the character of the Khalifa, and his anti-English sympathies are now and then apparent, as when he attributes the picture drawn by Slatin of the Khalifa's rule to the pressure of the Intelligence Department.

Egyptian Sudan. *Verh. Ges. Erdk. Berlin* **28** (1901): 217–225. **Linck.**

Bericht über seine Reise nach Kordofan. Von Prof. Dr. G. Linck. *With Map.*

The writer accompanied Slatin Pasha on a recent visit to Kordofan.

French Congo. *Rev. Française* **26** (1901): 321–335. **Gentil.**

La Conquête du Tchad: Mission Congo-Chari. Par M. Gentil. *With Map.*

French Congo. *Deutsch. Kolonialzeitung* **18** (1901): 185–186. **Kannengiesser.**

Die Verwaltung des Schari-Gebietes. Von G. A. Kannengiesser. *With Map.*

French Congo. *B.S.G. Com. Paris* **22** (1900): 271–293. **Montrozier.**

Les Sultanats de M'Bomou. Par M. R. Cobrat de Montrozier.

French Congo—Ogowe. *B.S.G. Com. Paris* **23** (1901): 126–141. **Avelot.**

Dans la boucle de l'Ogooué. Par René Avelot. *With Map.*

Account of surveys executed in 1899 in the southern Ogowe basin.

French West Africa. *B. Comité l'Afrique Française* **11** (1901): 184–197. **Joalland.**
Les missions du Chari et de l'Afrique Centrale. La mission Joalland-Meynier. *With Map and Portraits.*

French West Africa. *Rev. Française* **26** (1901): 335–351. **Joalland.**
De Zinder au Tchad: Mission Afrique centrale. Par P. Joalland.

French West Africa. *B. Comité l'Afrique Française* **11** (1901): 178–181. **Terrier.**
Le territoire militaire de Zinder et la Convention de 1898. Par M. Auguste Terrier.

Urges the necessity, from the French point of view, of a rectification of the frontier between British Nigeria and the French Sahara.

French West Africa. *La G., B.S.G. Paris* **3** (1901): 353–368. **Gentil.**
Occupation et organisation des territoires du Tchad. Par M. Gentil.

French West Africa. *La G., B.S.G. Paris* **3** (1901): 369–380. **Joalland.**
De Zinder au Tchad et conquête du Kanem par le Capitaine P. Joalland.

German Colonies. *Rev. Française* **26** (1901): 269–280. **Vasco.**
Les Colonies Allemandes d'Afrique. Par G. Vasco. *With Map.*

German East Africa. *M. Deutsch. Schutzgeb.* **14** (1901): 114–124. **Kandt.**
Bericht des Forschungsreisenden Dr. Kandt aus Ruanda.

A note on Dr. Kandt's latest journeys appears in the Monthly Record.

German East Africa. *M. Deutsch. Schutzgeb.* **14** (1901): 106–113. **Prüssing.**
Ueber das Rufiyi-Delta. Von Kapitän Prüssing. *With Map.*

A note on this paper will appear elsewhere.

German East Africa. *Deutsch. Kolonialblatt* **12** (1901): 441–444. ———
Grenzreise des Stationschefs von Iringa. *With Map.*

On a journey made early in 1901 round the borders of the Iringa district (Uhehe).

German South-West Africa. *M. Deutsch. Schutzgeb.* **14** (1901): 91–105. **Görgens.**
Das Landvermessungs- und Fortschreibungssystem der Kapkolonie und seine modifizirte Anwendung in Deutsch-Südwestafrika. Nach einem Bericht von Regierungslandmesser H. Görgens.

German South-West Africa. *Deutsch. Kolonialblatt* **12** (1901): 317–318. ———
Vegetationsverhältnisse in Swakopmund.

This is referred to in the Monthly Record (*ante*, p. 90).

Ivory Coast. *Globus* **79** (1901): 313–318. **Singer.**
Woelffels Reisen im Hinterlande der Elfenbeinküste. Von — Singer. *With Map and Illustrations.*

Kamerun. *Sitzb. A. W. Berlin* (1901): 277–299, 400–417. **Esch.**
Der Vulcan Etinde in Kamerun und seine Gesteine. Von Dr. E. Esch. *With Illustrations.*

Kamerun. **Dominik.**
Kamerun. Sechs Kriegs- und Friedensjahre in deutschen Tropen. Von Hans Dominik. Berlin: E. S. Mittler & Sohn, 1901. Size 10¼ × 7½, pp. viii. and 316. *Map and Illustrations. Price 9s. 9d.*

This is noticed with other African books in the present number of the *Journal*.

Kamerun. *Deutsch. Kolonialblatt* **12** (1901): 275–278. **Puttkamer.**
Expedition des Gouverneurs nach den Crossschnellen. *With Map.*

The return route from the Cross river was to a large extent the same as that followed by Ramsay (see below).

Kamerun. *Deutsch. Kolonialblatt* **12** (1901): 234–238. **Ramsay.**
Expedition des Generalbevollmächtigten der Gesellschaft Nordwest-Kamerun.

From a report by Captain Ramsay on a journey in the upper basin of the Cross river, an important hitherto unknown tributary of which was discovered.

Madagascar—Surveys. *Rev. G.* **48** (1901): 508–513. ———

Aperçu général sur les travaux Géographiques exécutés à Madagascar, d'après les documents officiels.

Marocco. *La G., B.S.G. Paris* **3** (1901): 381–390. **Weisgerber.**

Itinéraire de Salé à Tanger. Par Dr. F. Weisgerber. *Map and Illustrations.*

Marocco. *Questions Dipl. et Colon.* **12** (1901): 1–13. **Caix.**

L'Angleterre et la question du Maroc. Par Robert de Caix. *With Map.*

Masai Language. **Hinde.**

The Masai Language. Grammatical Notes together with a vocabulary. Compiled by H. Hinde. Cambridge: The University Press, 1901. Size 7½ × 5, pp. x. and 76. *Presented by the Publishers.*

This is virtually the first attempt which has been made to reduce the complicated Masai language to grammatical rule. Mrs. Hinde's method consisted in framing a number of sentences after the same model and obtaining the Masai equivalents, any feature maintained throughout being taken to supply the required rule. The authoress takes exception to both Erhardt's and Sir Harry Johnston's method of writing Masai. As to the pronunciation of the name, she says the stress is decidedly on the first syllable, and that the *s* is soft.

Niger. *B. Comité l'Afrique Française* **11** (1901): 221–223. **Terrier.**

La flottille du Bas-Niger à Say. Par M. Auguste Terrier. *With Maps.*

On the French Niger Expedition under Captain Lenfant. The maps show the position of the French *enclaves.*

Nile—Fauna. *P. Zoolog. S.* (1900): 950–973. **Flower.**

Notes on the Fauna of the White Nile and its Tributaries. By Captain Stanley Smyth Flower.

North-East Africa. *Verh. Ges. Erdk. Berlin* **28** (1901): 240–248. **Erlanger.**

Ueber die Reise von Carlo Frhr. v. Erlanger in den Galla-Ländern. *With Map.*

See note, *ante*, p. 214.

North-East Africa. *P. Zoolog. S.* (1900): 800–807. **Thomas.**

List of Mammals obtained by Dr. Donaldson Smith during his recent Journey from Lake Rudolf to the Upper Nile. By Oldfield Thomas.

Sahara. *B.S.G. Lille* **35** (1901): 347–370. **Foureau.**

De l'Algérie au Congo par l'Aïr et le Tchad. Par Fernand Foureau. *With Portrait and Map.*

Sahara. *C. Rd.* **132** (1901): 388–392. **Lapparent.**

Sur la découverte d'un Oursin d'âge crétacé dans le Sahara oriental. Par M. A. de Lapparent. Size 11 × 8½, pp. 6. *Also separate copy, presented by the Author.*

See note in Monthly Record (*ante*, p. 88).

Sahara. **Sommerville.**

Sands of Sahara. By Maxwell Sommerville. Philadelphia: J. B. Lippincott Co., 1901. Size 8½ × 6, pp. 162. *Illustrations. Price* 10*s.* 6*d. Presented by the Author.*

Notes of travel, popular in character.

Sahara. *Rec. G. Int.* **25** (1901): 193–214. **Foureau and Lamy.**

Mission Foureau-Lamy.

Sahara—Adrar. *B.S.G. Com. Paris* **22** (1900): 267–280. **Jouinot-Gambetta.**

La mission Blanchet dans l'Adrar. Par M. le Lt. Jouinot-Gambetta. *Illustrations.*

Sierra Leone. **Gore.**

Sierra Leone. Report for 1900. Colonial Reports, Annual No. 324, 1901. Size 9½ × 6, pp. 40. *Price* 2½*d.*

South Africa. **Bleloch.**

The New South Africa, its Value and Development. By W. Bleloch. London: W. Heinemann, 1901. Size 9 × 6, pp. xvi. and 436. *Maps and Diagrams. Price* 10*s.*

A careful study of the resources of South Africa, and of the work which lies before the British Administration in the New Colonies. The writer champions the Uitlanders as a hard-working, sober, and enterprising set of men, among whom, though little luxury is to be found, all the decencies and many of the elevating influences of life are observed and cultivated. As regards the native question, he deprecates the idea of equality between white and black, which cannot exist without fusion between the races, which is certainly not wanted. If somewhat optimistic, the book is evidently the outcome of a thoughtful consideration of the problems awaiting solution.

South Africa. **Reclus.**

Elisée Reclus. L'Afrique Australe. Mise a jour par Onésime Reclus. Paris, 1901. Size 9 × 7, pp. 358. *Maps. Price* 10*s.*

A very full and carefully compiled account of our present knowledge of South Africa.

South Africa. *Quarterly Rev.* **193** (1901): 224–257, 544–583. ———

The Settlement of South Africa.

An examination of the resources of South Africa and other points bearing on its future development.

South Africa—Native Races. ———

The Natives of South Africa, their Economic and Social Condition. Edited by the South African Native Races Committee. London: John Murray, 1901. Size 9 × 6, pp. xiv. and 360. *Maps. Price* 12*s. net. Presented by the Publisher.*

The investigations set on foot in 1899 by the Native Races Committee, with a view to throwing trustworthy light on the native question in South Africa, seem to have been carried out with thoroughness, and in an impartial spirit. The results, set forth in this volume, should be of much value to all interested in the future of South Africa. In the summary and conclusions contained in chapter xv., the necessity of considering, not merely the welfare of the natives, but their claims to form part of the future commonwealth, is insisted on.

South Central Africa. **Reid.**

Journeys in the Linyanti Region. By Percy C. Reid. (From the *Geographical Journal* for June, 1901.) Size 10 × 6½, pp. 16. *Map and Illustrations.*

Togo. *M. Deutsch. Schutzgeb.* **14** (1901): 71–76. **Preil.**

Höhenmessungen von Bergassessor a. D. Fr. Hupfeld auf der Douglasschen Togo-Expedition. Berechnet von Oberleutnant Preil.

Höhenmessungen im Hinterlande von Togo. Berechnet von Oberleutnant Preil.

Togo. *Globus* **79** (1901): 217–220. **Seidel.**

Togo im Jahre 1900. Von H. Seidel.

Togo. *Deutsch. Kolonialblatt* **12** (1901): 238–239, 278–282, 314–316. ———

Ueber die Verhältnisse im Bezirk Misahöhe.

Transvaal. *B.S.G. Com. Paris* **22** (1900): 505–534. **Léon.**

La Transvaal, causerie par M. S. Léon.

Tristan da Cunha. *Nautical Mag.* **70** (1901): 208–218. **Lord.**

Tristan da Cunha. By W. B. Lord.

Sketch of the history of Tristan da Cunha, and of various shipwrecks in its vicinity.

Uganda. **Johnston.**

Africa. No. 7 (1901). Report by His Majesty's Special Commissioner on the Protectorate of Uganda. London: Eyre & Spottiswoode, 1901. Size 13½ × 8½, pp. 26. *Map. Price* 9*d.*

This is noticed in the Monthly Record (*ante*, p. 309).

NORTH AMERICA.

Alaska. *B.S.G. Com. Havre* **17** (1900): 241–247; **18** (1901): 300–310. **Vallois.**

Trois mois au cap Nôme (Alaska). Par M. Paul Vallois.

Alaska. ——

Explorations in Alaska in 1898.—Twentieth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1898-99. Part vii. Washington, 1900. Size 11½ × 8, pp. 510. *Maps and Illustrations. Presented by the U.S. Geological Survey.*

This will be noticed with other reports on Alaskan Exploration.

Alaska and N.W. Canada. *Mazama* **2** (1901): 75–82. **Davidson.**

Explanation of an Indian Map of the Rivers, Lakes, Trails, and Mountains from the Chilkaht to the Yukon drawn by the Chilkaht chief, Kohklux, in 1869. By George Davidson, PH.D. *With Map.*

Canada. **Lucas.**

A Historical Geography of the British Colonies. By C. P. Lucas, C.B. Vol. v. Canada—Part i. (New France). Oxford: the Clarendon Press, 1901. Size 7½ × 5, pp. 364. *Maps. Price* 6*s. Presented by the Clarendon Press.*

The new volume of Mr. Lucas' well-known work fully sustains the character of its predecessors. It deals with the history of France and Great Britain in Canada and adjacent parts of North America down to 1763, and presents incidentally a useful sketch of the progress of geographical discovery in North America in the sixteenth and seventeenth centuries. As usual, the author is at pains to elucidate the reasons for the course taken by the historical events.

Canada. *Climate* **2** (1901): 112–120. **Newnham.**

From Churchill to York on Snowshoes. By the Right Rev. Bishop Newnham, D.D. *With Illustrations.*

Account of a winter journey, during which temperatures reaching to 43° below zero Fahr. were experienced.

Canada. *T. Hist. and Sci. S. Manitoba*, No. 57 (1901): pp. 16. **Bryce.**

Early Red River Culture. By Mrs. George Bryce. *With Illustrations.*

Culture, in reference to the Red river, is understood by the author in a comparative sense only, as "Something analogous to making the best of one's self under difficult circumstances."

Canada. *J.R. Colonial I.* **32** (1901): 399–403. **McDougall.**

North-Western Canada. By the Rev. John McDougall.

Canada. *P. and T. Nova Scotian I. Sci.* **10** (1900): 303–318. **MacKay.**

Phenological Observations, Canada, 1899. By A. H. MacKay, LL.D. *Diagram.*

Canada. *T. Hist. and Sci. S. Manitoba*, No. 58 (1901): pp. 8. **McLean.**

Notes and Observations of Travels on the Athabasca and Slave Lake Regions in 1899. By W. J. McLean.

Canada. *Imperial I. J.* **7** (1901): 126–129. **Strathcona.**

Canada and the Empire. By the Rt. Hon. the Lord Strathcona and Mount Royal, G.C.M.G.

Canada. ——

Annual Report of the Department of the Interior for the year 1900. Ottawa, 1900. Size 10 × 6½, pp. viii., xxxviii., 120, 188, 48, 16, 16, 8, 6, 16. *Map and Illustrations.*

As usual, this report contains a large amount of valuable information on Canadian surveys, mineral and other resources, immigration, etc. (cf. *ante*, p. 312).

Canada. ——

Tide Tables for Charlottetown, Pictou, and St. Paul Island, C.B., for 1901. With Tidal Differences for Northumberland Strait; and for the open Gulf shore, from Miramichi along the north coast of Prince Edward Island. Ottawa, 1900. Size 10 × 6½, pp. 12.

Canada. ——

Tide Tables for Halifax, Quebec, St. John, N.B., and St. Paul Island, for the year 1901, with Tidal Differences for the Atlantic Coast of Nova Scotia, the St. Lawrence River and Gulf, and the Bay of Fundy. Reprinted from *Greenwood's Nautical Almanac and Tide Tables for* 1901. Size 8½ × 7, pp. 12

Canada—Historical. **Wrong and Langton.**

University of Toronto Studies. History, First Series, Vol. 5. Review of Historical Publications relating to Canada for the year 1900. Edited by Prof. George M. Wrong and H. H. Langton. Toronto, 1901. Size 10½ × 7, pp. xii. and 226. *Presented by the University of Toronto.*

Canada—Historical. *T. Hist. and Sci. S. Manitoba*, No. 59 (1901): pp. 16. **Jonasson.**

The Early Icelandic Settlements in Canada. By Mr. Sigtr. Jonasson.

Canada—Hudson Bay. **Campbell.**

The Father of St. Kilda. Twenty Years in Isolation in the Sub-Arctic Territory of the Hudson's Bay Company. By Roderick Campbell. London: W. R. Russell & Co., 1901. Size 8 × 5, pp. xvi. and 328. *Portrait. Presented by the Author.*

The author, whose early years were spent in the remotest parish of the island of Lewis, gives in this work a personal narrative of his adventures, from 1859 onwards, in the lands around Hudson bay. The book gives a vivid idea of the condition of life in those regions half a century ago.

Canada—Indians. ———

Canada. Memorandum on the Legal Status of British North American Indians. Colonial Reports, Miscellaneous, No. 15, 1900. Size 9½ × 6, pp. 22. *Price* 1½*d.*

Contains information as to the Indian reserves in Canada.

Canada North-West Territories. **Garry.**

Diary of Nicholas Garry, Deputy-Governor of the Hudson's Bay Company from 1822–1835. A detailed narrative of his travels in the North-West Territories of British North America in 1821. (From the *Transactions* of the Royal Society of Canada. Second Series, 1900–1901, Vol. vi., Section ii.) Ottowa: J. Hope & Sons, 1900. Size 10 × 6½, pp. 72–204. *Portrait and Illustrations. Price* 5*s. Presented by Mr. Bernard Quaritch.*

This will be specially noticed.

Canada—Pilot. ———

Supplement, 1901, relating to the St. Lawrence Pilot. Vol. i. [Sixth Edition, 1894.] (Corrected to January, 1901.) London: J. D. Potter, 1901. Size 9½ × 6, pp. 48. *Price* 4*d.*

Canada—Place-names. ———

Annual Report of the Geographic Board of Canada, 1900. (Supplement to the Thirty-Third Annual Report of the Department of Marine and Fisheries, Marine). Ottawa, 1901. Size 10 × 6½, pp. 46.

Since the date of the last report (*Journal*, vol. xiv. pp. 668) decisions have been arrived at in the case of 1307 names, bringing the total number to 1708. Among the forms adopted are the following: Kicking Horse river (not Wapta); Liard (not Mountain) river; Lewes river (not Lewis); Islands of God's Mercie (Hudson strait: not Middle Savage islands); Abitibi (not Abitibbi); Waddell bay (not Dyer sound); Nottaway river (not Noddawai). The termination of the last is not consistent with the rules.

Canada—Rocky Mountains. *Appalachia* **9** (1901): 289–302. **Scattergood.**

The Beaverfoot Valley and Mount Mollison. By Mr. J. Henry Scattergood. *With Sketch-map and Illustration.*

Canada—Rocky Mountains. *Appalachia* **9** (1901): 314–316. **Vaux.**

The Wapta Fall. By George S. Vaux, jun. *With Illustration.*

This fall, among the mountains north of the Canadian Pacific Railway, is estimated to have a total height of 1050 to 1200 feet.

Mexico. *P.I. Civil Engineers* **143** (1901): 286–295. **Body.**

The Drainage of the Valley of Mexico. By J. B. Body.

A historical sketch of operations for the draining of the valley of Mexico, beginning from 1607.

Mexico. **Magliano.**

Notizie sul Messico in attinenza cogli interessi italiani: Rapporto del conte R. Magliano di Villar San Marco. (Boll. Ministero Affari Esteri, Novembre, 1900.) Roma. Size 9½ × 6¼, pp. 30.

On the trade and resources of Mexico.

Mexico—Cacao. Lemcke.

Beiträge Kolonialpolitik u. Kolonialwirtschaft **2** (1900–1901): 554–563.

Die Kakao-Kultur in Mexiko. Von Heinrich Lemcke.

Mexico—Rubber. Lemcke.

Beiträge Kolonialpolitik u. Kolonialwirtschaft **2** (1900–1901): 481–487.

Die Gummi-Kultur in Mexiko. Von Heinrich Lemcke. *With Illustrations.*

Newfoundland—Historical. Wagner.

Découverte et Évolution cartographique de Terre-Neuve, et des pays circonvoisins, 1497–1501–1769. Par H. Harrisse. Von Hermann Wagner. (Sonder-Abdruck aus den Göttingischen gelehrten Anzeigen unter der Aufsicht der Königl. Gesellschaft der wissenschaften, 1901, Nr. 2.) Size 9½ × 7, pp. [8]. *Presented by the Author.*

A review of M. Harrisse's recent work.

North America—Mammals. Elliot.

A Synopsis of the Mammals of North America and the Adjacent Seas. By Daniel Giraud Elliot. (Field Columbian Museum, Publication 45. Zoological Series, vol. ii.) Chicago, 1901. Size 10 × 6½, pp. xiv. and 472. *Illustrations.*

United States. [Wilson.]

Report of the Secretary of Agriculture, 1900. Washington, 1900. Size 9 × 6, pp. 76.

United States. ——

Annual Report of the Board of Regents of the Smithsonian Institution, showing the operations, expenditures, and condition of the Institution for the year ending June 30, 1897. Report of the U.S. National Museum, Part ii. Washington, 1901. Size 9½ × 6, pp. xii. and 516. *Portraits.*

The same, for the year ending June 30, 1899. Washington, 1901. Pp. xv. and 598.

The first-named volume forms a memorial of George Brown Goode, with selections from his papers.

United States—Colorado. *Alpine J.* **20** (1901): 360–368. Anderson.

The Grand Cañon of the Colorado River. By Tempest Anderson. *With Illustrations.*

Account of an excursion carried out in company with Prof. W. M. Davis (see below).

United States—Colorado. Davis.

An Excursion to the Grand Cañon of the Colorado. By W. M. Davis. (*Bulletin* of the Museum of Comparative Zoölogy at Harvard College, vol. xxxviii. Geological Series, vol. v. No. 4.) Cambridge, Mass., 1901. Size 9½ × 6, pp. 105–201. *Maps and Illustrations.*

A note on this paper will be given.

United States—Idaho. *Monthly Weather Rev.* **29** (1901): 19–20. Blandford.

Some Features of the Climate of Idaho. By S. M. Blandford. *With Diagram.*

United States—Maryland. ——

Maryland Geological Survey. Allegany County. Baltimore: The Johns Hopkins Press, 1900. Size 10½ × 7, pp. 324. *Maps and Illustrations. Presented by the Maryland Geological Survey.*

United States—Naval Observatory. ——

Report of the Superintendent of the United States Naval Observatory for the fiscal year ending June 30, 1900. Washington, 1900. Size 9 × 6, pp. 34. *Presented by the U.S. Naval Observatory.*

United States—North Carolina. Grave.

Johns Hopkins Univeresity Circulars **20** (1901): 50–53.

The Oyster Reefs of North Carolina: a Geological and Economic Study. By Caswell Grave, PH.D. *With Chart.*

United States—Texas. *B. United States Geolog. Surv.*, No. 164 (1900): 100. Vaughan.

Reconnaissance in the Rio Grande Coal Fields of Texas. By Thomas Wayland Vaughan. Including a report on Igneous Rocks from the San Carlos Coalfield. By E. C. E. Lord. *With Maps and Illustrations.*

United States—Utah. *B. United States Geolog. Surv.*, No. 166 (1900): 44. **Gannett.**
A Gazetteer of Utah. By Henry Gannett. *With Map.*

United States—Utah. *Monthly Weather Rev.* **29** (1901): 22–24. **Murdoch and Gilbert.**
Relation of the Water Level of Great Salt Lake to the Precipitation. By L. H. Murdoch. *With Diagram.*
The Water Level of Great Salt Lake. By G. K. Gilbert.

United States—Washington—Mount Rainier. *Mazama* **2** (1901): 93–117. **Piper.**
The Flora of Mount Rainier. By Prof. Chas. V. Piper.

CENTRAL AND SOUTH AMERICA.

Andes. **Olascoaga.**
Topografía Andina. Ferrocarril paralelo á los Andes como fomento de población y Seguridad de la Frontera. Complemento indispensable de la Campaña de 1879. Por el Coronel M. J. Olascoaga, Buenos Aires, 1901. Size 10½ × 6½, pp. 132. *Maps.*

A sketch of the geography of the southern Andine provinces of Argentina, with a scheme for a railway from Mendoza to the headwaters of the Neuquen parallel to the Andes.

Argentine Republic. **Hankin.**
Trade of Consular District of Buenos Ayres for the year 1900. Foreign Office, Annual No. 2615, 1901. Size 10 × 6, pp. 40. *Price* 2½*d.*

Bolivia—Andes. **Conway.**
The Bolivian Andes. A Record of Climbing and Exploration in the Cordillera Real in the years 1898 and 1900. By Sir Martin Conway. London and New York: Harper & Bros., 1901. Size 9 × 6, pp. x. and 404. *Illustrations. Price* 12*s.* 6*d. Presented by the Publishers.*

This will be fully noticed elsewhere in the *Journal.*

Bolivia—Boundary Question. *B.S.G. La Paz* **3** (1901): 101–197. **Iraizós.**
Asuntos Internacionales. I. El Sudeste de Bolivia. Por Francisco Iraizós. *Map. Also separate copy, presented by the Sociedad Geografica de La Paz.*

This is the first of a series of papers to be published by the Geographical Society of La Paz, dealing with questions of frontier between Bolivia and neighbouring states. The present paper is concerned with the frontier with Paraguay, which is claimed to be formed by the Pilcomayo and Paraguay rivers.

Bolivia and Brazil. *B.S.G. La Paz* **3** (1901): 210–219. **Camacho.**
La cuestión internacional del Acre (Conferencia pronunciada en la tercera sesión de la Universidad de La Paz.) Por Juan T. Camacho.

Bolivia and Brazil. *B.S.G. La Paz* **2** (1900): 1–12; **3** (1901): 198–204. **Saavedra.**
Los límites con el Brasil y la "cuestión del Acre." Por Bautista Saavedra.

The Acre is a southern tributary of the Purus also called Aquiry, on which the Bolivians state that encroachments have been made from the side of Brazil.

Brazil. **Branner and Gilman.**
The Stone Reef at the mouth of Rio Grande do Norte, Brazil. By J. C. Branner and C. E. Gilman. (From the *American Geologist*, vol. xxiv., December, 1899.) Size 9½ × 6½, pp. [4].

This reef stretches like a long, low, nearly straight wall across the mouth of the river, giving the idea of a work of art.

Brazil. *B.S.G. Com. Paris* **22** (1900): 315–319. **Néry.**
L'Amazonie brésilienne. Par le baron de Santa Anna Néry.

Brazil—Maranhao. **Temple.**
Report on the State of Maranhão. Foreign Office, Miscellaneous, No. 547, 1901. Size 9½ × 6, pp. 20. *Price* 1½*d.*

A summary of the geography, resources, commerce, etc., of the state.

Brazil—Parana. **Tonissi.**
L'Esploraz. Com. **15** (1900): 201, 209, 252, 273; **16** (1901): 8, 23, 40, 72, 81.
Escursioni nello Stato del Paranà (Brasile). By L. Tonissi. *With Maps.*

Brazil—Pernambuco. **Howard.**
Trade of Consular District of Pernambuco for the year 1900. Foreign Office, Annual No. 2591, 1901. Size 9½ × 6, pp. 32. *Price 2d.*

Central America. *B.I. Fis.-G. Costa Rica* **1** (1901): 87–90. **Pittier.**
Un descubrimiento importante para Centro-América. Por Enrique Pittier.
On the recent discovery of a species of *Tabernaemontana* yielding a product similar to guttapercha.

Central America. *G.Z.* **7** (1901): 343–346. **Werth.**
Ueber die geologische Bedeutung der tropischen Vegetationsformationen in Mittelamerika und Südmexiko. Nach Carl Sapper. Von E. Werth.

Chile. **Gormaz.**
Hundimiento o Solevantamiento de los Archipiélagos Australes de Chile. Por Francisco Vidal Gormaz. Santiago de Chile, 1901. Size 10 × 7, pp. 24.

Costa Rica. *B.I. Fis.-G. Costa Rica* **1** (1901): 10–29. **Pittier.**
Primer ensayo de un mapa de la declinación magnética en Costa Rica. Por Enrique Pittier.

Dutch West Indies—Curaçoa. **Jesurun.**
Trade of Curaçoa and its Dependencies for the year 1900. Foreign Office, Annual No. 2594, 1901. Size 9½ × 6, pp. 26. *Price 2d.*

Ecuador. *C. Rd.* **132** (1901): 1444–1446. **Gonnessiat.**
Six Mois d'observations météorologiques à Quito. Par M. F. Gonnessiat.

Jamaica. **Olivier.**
Jamaica. Report for 1899-1900. Colonial Reports, Annual No. 317, 1901. Size 9½ × 6, pp. 86. *Price 4½d.*

Jamaica. **Roxburgh and Ford.**
The Handbook of Jamaica for 1901, comprising Historical, Statistical, and General Information concerning the Island. Compiled by T. L. Roxburgh and Jos. C. Ford. London: E. Stanford, 1901. Size 9 × 5½, pp. viii. and 560. *Map. Price 7s. 6d. net. Presented by the Publisher.*
This useful publication has now reached its twenty-first year of issue.

Nicaragua. **Chambers.**
Trade of Nicaragua for the year 1900. Foreign Office, Annual No. 2585, 1901. Size 9½ × 6, pp. 12. *Price 1d.*

Nicaragua Canal. *Questions Dipl. et Colon.* **11** (1901): 734–741. **Franklin.**
Le canal de Nicaragua. Par J. H. Franklin.
The writer thinks that the Americans will ultimately recognize the advantages presented by the Panama, as compared with the Nicaragua route.

Patagonia. *Ann. G.* **10** (1901): 232–259. **Gallois.**
Les Andes de Patagonie. Par M. L. Gallois. *With Map and Plates. Also separate copy, presented by the Author.*
The writer here combines the results of all recent investigations into a useful general description of the Patagonian Andes.

Peru. **Reader.**
Peru: its present financial, commercial, and political conditions. [By A. B. Reader.] [1899.] Size 9½ × 6, pp. 34.

Political Geography. *National G. Mag.* **12** (1901): 169–175. **Foster.**
The Latin-American Constitutions and Revolutions. By John W. Foster.

South America. **Garland.**
South American Conflicts and the United States. By Alejandro Garland. Lima. [1900]. Size 10½ × 7½, pp. xxiv. and 14.

On the relations between Chili and Peru arising from the war of 1881–83, and the attempted mediation of the United States during the conflict.

South America. **Keane and Markham.**

Stanford's Compendium of Geography and Travel (New issue). Central and South America. Vol. i. By A. H. Keane. Edited by Sir Clements Markham, K.C.B., F.R.S. London: E. Stanford, 1901. Size 8 × 5½, pp. xxii. and 612. *Maps and Illustrations. Price* 15*s*. *Presented by the Publisher.*

The appearance of a new, entirely re-written edition of 'South America' in this series is particularly welcome, owing to the amount of scientific work done in that continent during the last two decades of the nineteenth century, and the various political questions which have arisen within the last few years. The want of a comprehensive and trustworthy account of South America at the present day has long been felt, and it is satisfactory to feel that it is now in a way to be supplied. The first three chapters give a useful general survey of the physical, ethnical, and political relations of the continent. The work is fully reviewed in the August number of the *Journal*.

Trinidad. *J.R. Colonial I.* **32** (1901): 377–398. **Jerningham.**

Trinidad and its Future Possibilities. By Sir Hubert E. H. Jerningham, K.C.M.G.

AUSTRALASIA AND PACIFIC ISLANDS.

Australia—Botany. **Banks and Solander.**

Illustrations of the Botany of Captain Cook's Voyage Round the World in H.M.S. *Endeavour*, in 1768–71. By the Right Hon. Sir Joseph Banks and Dr. Daniel Solander, F.R.S. With Determinations by James Britten. Australian Plants. Part ii. London: Longmans & Co., etc., 1901. Size 19½ × 13, pp. 35–75 [142]. *Plates. Presented by the Trustees of the British Museum.*

The first part, published last year, was noticed in vol. xvi. of the *Journal*, p. 254. Several important orders are illustrated in the present instalment.

Fiji. *T. and Ninth Annual Rep. Liverpool G.S.* (1900): 53–71. **Finucane.**

Islands and People of Fiji. By Morgan J. Finucane.

German New Guinea. *M. Deutsch. Schutzgeb.* **14** (1901): 131–138. **Pflüger.**

Einige geologische Bemerkungen über den Bismarck-Archipel. Von Privatdozent Dr. Pflüger.

German New Guinea. *Deutsch. Kolonialblatt* **12** (1901): 282–283. **Bennigsen.**

Reise des Gouverneurs nach dem Süden von Deutsch-Neu-Guinea.

New South Wales. **Bonwick.**

Captain Cook in New South Wales, or the Mystery of naming Botany Bay. By James Bonwick. London: Low & Co., 1901. Size 8½ × 5½, pp. 32.

A criticism of Hawkesworth's account of Cook's first voyage. The writer thinks that Hawkesworth had access to no original log or journal of Cook's.

New South Wales.

New South Wales. Statistical Register for 1899 and previous years. Sydney, 1900. Size 10 × 6½, pp. viii. and 1014. *Presented by the Agent-General for New South Wales.*

Pacific—Ethnology. **Brigham.**

Occasional Papers of the Bernice Pauahi Bishop Museum of Polynesian Ethnology and Natural History. Vol. i. No. 2. Director's Report for 1899. Honolulu, 1900. Size 10 × 6, pp. 80. *Illustrations.*

Contains, in addition to the report on the work of the museum, papers on special subjects, including one on the mat sails of the Pacific, by J. F. G. Stokes.

Pacific Islands. **Brigham.**

An Index to the Islands of the Pacific Ocean: a Handbook to the Chart on the walls of the Bernice Pauahi Bishop Museum of Polynesian Ethnology and Natural History. By William T. Brigham. Honolulu: Bishop Museum Press, 1900. Size 12½ × 10, pp. 172. *Maps.*

This is a most useful guide to the nomenclature of the Pacific islands. In the case of non-native names, the origin of which is often difficult to arrive at, the circumstances under which the names were given are, as a rule, mentioned. The introduction gives a sketch of the history of discovery, and of the general geography and ethnology of the Pacific, while the main facts relating to the more important islands are summarized in the alphabetical index.

Queensland. **Cameron and Wilson.**

Report on Geology of the West Moreton or Ipswich Coal Field. By Walter E. Cameron. Also Queensland Coal: its Economic Value as a Steam Coal. [A Paper read before the Queensland Institute of Mechanical Engineers, December, 1892, by Robert Wilson.] Brisbane, 1899. Size 13 × 8½. *Maps and Sections.*

Queensland. *Queensland Gov. Mining J.* **1** (1900): 244–248, 288–292. **Dunstan.**

Clermont Coal Measures. Report by Mr. B. Dunstan, Assistant Government Geologist. *With Sections.*

Queensland—Almanac and Directory. **Pugh.**

Pugh's Queensland Almanac and Directory for 1901. Brisbane: Gordon & Gotch. Size 9 × 5½, pp. xxxii. and 1174. *Presented by the Publishers.*

Samoa. *Kolon. Z.* **2** (1901): 92–95. ——

Aus Samoa.

Describes the present economic position in Samoa.

Solomon Islands. **Woodford.**

British Solomon Islands. Report for 1899–1900. Colonial Reports, Annual No. 320, 1901. Size 9½ × 6, pp. 16. *Price* 1*d.*

See note in Monthly Record, *ante*, p. 94.

South Pacific Ocean. **Kettle.**

A Supplement to the Fifth Edition of Findlay's Sailing Directory for the South Pacific Ocean, including revised descriptions of the Coasts, Islands, etc. By W. R. Kettle. London: R. H. Lawrie, 1901. Size 10 × 6, pp. 386. *Price* 7*s.* 6*d.* *Presented by the Publisher.*

Tasmania. **Thureau.**

Geological Society of Australasia. Notes on the occurrence of native copper at Mount Lyell, West Coast, Tasmania, with observations upon the Genesis of the Ores. By G. Thureau. Melbourne, 1900. Size 9 × 5½, pp. 12.

Western Australia. **Vivienne.**

Travels in Western Australia, being a description of the various Cities and Towns, Goldfields, and Agricultural Districts of that State. By May Vivienne. London: W. Heinemann, 1901. Size 9 × 6, pp. xvi. and 344. *Illustrations. Price* 15*s.*

Contains useful descriptions of the industries and resources of Western Australia as to which the authoress takes a very sanguine view.

Western Australia. **Clifton.**

Western Australia. Department of Lands and Surveys Report. By the Under-Secretary for Lands for the year 1899. Perth, 1900. Size 13 × 8½, pp. 66. *Illustrations. Presented by the Victoria Public Library of Western Australia.*

Contains an account, with illustrations, of the caves near the Margaret river, said to excel in extent, picturesqueness, and variety the Jenolan caves in New South Wales. The need of their protection is emphasized.

Western Australia. *P.R.S. Queensland* **16** (1901): 9–34. **Hann.**

Exploration in Western Australia. By Frank Hann.

An account of two journeys to the north-western interior of Western Australia. Very few dates are given, but the first journey seems to have been undertaken in 1896. A map is mentioned, but does not accompany the paper.

Western Australia. ——

Western Australia. Annual Progress Report of the Geological Survey for the year 1899. Perth, 1900. Size 13½ × 8½, pp. 58. *Maps and Illustrations.*

POLAR REGIONS.

Antarctic. **Arçtowski and Renard.**

Notice Préliminaire sur les Sédiments Marins recueillis par l'Expédition de la "Belgica." Par H. Arçtowski et A. F. Renard. Bruxelles, 1901. Size 9 × 6, pp. 30. *Map.*

Antarctic. *J. Franklin I.* **151** (1901): 241, 321, 413; **152** (1901): 26. **Balch.**

Antarctica; a History of Antarctic Discovery. By Edwin Swift Balch. *With Charts.*

A valuable summary of the history of Antarctic Exploration. The writer pays special attention to the little-known work of the American whaling captains in the early part of the nineteenth century.

Antarctic—Belgian Expedition. **Arçtowski.**

Aperçu sur les Recherches Océanographiques de l'Expédition Antarctique Belge. Par M. Henryk Arçtowski. (Sonderabdruck aus den Verhandlungen des VII. Internationalen Geographen-Kongresses in Berlin, 1899.) Berlin, 1900. Size 10 × 6½, pp. 652–656. *Plate.*

Antarctic Expedition. **Markham.**

Address to the Royal Geographical Society. By Sir Clements R. Markham, K.C.B., etc. Considerations respecting Routes for an Antarctic Expedition. By Sir Clements R. Markham, K.C.B., etc. (From the *Geographical Journal* for July, 1901.) Size 10 × 6½, pp. 26.

Antarctic Expedition. **Markham.**

T. and Ninth Annual Rep. Liverpool G.S. (1900): 22–42.

The Antarctic Expedition. By Sir Clements R. Markham, K.C.B., etc.

Antarctic—German Expedition. *Verh. Ges. Erdk. Berlin* **28** (1901): 249–253. ———

Taufe des Deutschen Südpolarschiffes "Gauss."

Antarctic Manual. **Murray.**

The Antarctic Manual for the use of the Expedition of 1901. Edited by George Murray, F.R.S. With a Preface by Sir Clements R. Markham, K.C.B., F.R.S. London: Royal Geographical Society, 1901. Size 9 × 6, pp. xvi. and 586. *Maps and Illustrations.*

A summary of the contents of the Manual is given at p. 159, *ante*.

Arctic—Abruzzi Expedition. *Cosmos* **13** (1901): 30–40. **Cora.**

La Spedizione Artica di S. A. R. il Duca degli Abruzzi (1899-1900). Umberto Cagni raggiunge 86° 33′ 49″ lat. N. Cenni generali di Guido Cora.

Arctic Exploration. *M.G. Ges. Wien* **44** (1901): 53–73. **Anschütz-Kaempfe.**

Das europäische Eismeer und ein neuer Expeditionsplan nach dem Nordpole. Von Dr. Hermann Anschütz-Kaempfe.

The writer's project was described in the last volume of the *Journal* (xvii. p. 435).

Arctic Vegetation. *Sitzb. A.W. Wien* **109** (Ab. i.) (1900): 371–439. **Wiesner.**

Untersuchungen über den Lichtgenuss der Pflanzen im arktischen Gebiete. Photometrische Untersuchungen auf pflanzenphysiologischem Gebiete. (III. Abhandlung.) Von J. Wiesner.

The general results of Dr. Wiesner's researches were noticed in the *Journal* for June (vol. xvii. p. 665).

Greenland. **Dusén.**

Några viktigare vaxtfynd från nordöstra Grönland. Af P. Dusén. Size 9 × 5½, pp. [4]. [1901.]

A list of plants obtained from North-East Greenland, with statement of the localities, etc.

Greenland. **Nathorst.**

On the map of King Oscar Fjord and Kaiser Franz Josef Fjord in North-Eastern Greenland. By Dr. A. G. Nathorst. (From the *Geographical Journal* for January, 1901.) Size 10 × 6½, pp. 16. *Maps and Illustrations.*

MATHEMATICAL GEOGRAPHY.

Astronomy. **Downing.**

Taylor's General Catalogue of Stars for the Equinox 1835·0, from Observations made at the Madras Observatory during the years 1831 to 1842. Revised and Edited by A. M. W. Downing, D.Sc. Edinburgh, 1901. Size 12½ × 10, pp. 10 and cclxxviii.

Astronomy. ——

Publications of the United States Naval Observatory. Second Series, vol. i. Transit Circle Observations of the Sun, Moon, Planets, and Miscellaneous Stars, 1894–1899. Washington, 1900. Size 12 × 9, pp. cviii. and 402. *Presented by the U.S. Naval Observatory.*

Nautical Almanac. ——

The American Ephemeris and Nautical Almanac for the year 1904. Washington. Bureau of Equipment, 1901. Size 10½ × 7½, pp. 592. *Diagrams.*

Surveying. **Wilson.**

Topographic Surveying. Including Geographic, Exploratory, and Military Mapping, with hints on Camping, Emergency Surgery, and Photography. By Herbert M. Wilson. New York: John Wiley & Sons; London: Chapman & Hall. 1901. Size 9½ × 6, pp. xxx. and 910. *Maps and Illustrations.*

A comprehensive guide to all classes of surveys for mapping purposes, from the most detailed topographic to the crudest exploratory surveys. It is intended both as a handy reference-book for use in the field, and as a text-book for college instruction.

PHYSICAL AND BIOLOGICAL GEOGRAPHY.

Age of the Earth. **Rudzki.**

Sur l'age de la Terre. Par M. P. Rudzki. (Extrait du Bulletin de l'Académie des Sciences de Cracovie. Classe des Sciences Mathématiques et Naturelles. Février, 1901.) Cracovie, 1901. Size 10 × 6½, pp. 72–94.

Figure of the Earth. *J. Geology* **9** (1901): 244–249. **Keyes.**

Derivation of the Terrestrial Spheroid from the Rhombic Dodecahedron. By Charles R. Keyes.

On recent attempts, especially that of Richard Owen in 1888, to reduce the Earth to regular geometric form.

Geological History. **Burckhardt.**

Traces Géologiques d'un Ancien Continent Pacifique. Par Dr. Carl Burckhardt. Revista del Museo de La Plata (Du Tome x. page 177 et suivantes). La Plata, 1900. Size 11 × 7½, pp. 16. *Map and Illustration.*

Geological History. *M.G. Ges. Wien* **44** (1901): 71–103. **Lozinski.**

Die chemische Denudation—ein Chronometer der geologischen Zeitrechnung. Von Val. Ritt. v. Lozínski.

Geomorphology. *C. Rd.* **132** (1901): 1428–1430. **Lamothe.**

Sur le rôle des oscillations eustatiques du niveau de base dans la formation des systèmes de terrasses de quelques vallées. Note de M. de Lamothe.

Gravity. *Sitzb. A.W. Berlin* (1901): 328–336. **Helmert.**

Der normale Theil der Schwerkraft im Meeresniveau. Von F. R. Helmert.

Gravity. *G.Z.* **7** (1901): 305–322. **Messerschmitt.**

Die Verteilung der Schwerkraft auf der Erde. Von Dr. J. B. Messerschmitt.

Meteorology—Climates. *Abh. k.k. G. Ges. Wien* **3** (1901): pp. 52. **Coellen.**

Der Gegensatz in den aussertropischen Klimaten der continentalen West- und Ostküsten auf der Nordhemisphäre. Von Ludwig Coellen.

Meteorology—Rainfall. *Monthly Weather Rev.* **29** (1901): 6–8. **Alexander.**

The Relation of Rainfall to Mountains. By W. H. Alexander.

Meteorology—Relative Humidity. **Mazelle.**

Sitzb. k. A.W. Wien **108** (Ab. II. *a.*) (1899): 281–322.

Zur täglichen Periode und Veränderlichkeit der relativen Feuchtigkeit. Von Eduard Mazelle.

Oceanography. *Verh. Ges. Erdk. Berlin* **28** (1901): 226–232. **Schott.**

Die Wärmeverteilung in der Tiefsee, mit besonderer Berücksichtigung des "Valdivia"-Materials. Von Dr. G. Schott.

Oceanography. **Nansen.**

Some Oceanographical Results of the Expedition with the "Michael Sars" headed by Dr. J. Hjort in the summer of 1900. Preliminary Report by Fridtjof Nansen. Christiania: Printed by A. W. Brøgger, 1901. Size 9½ × 6, pp. 129–161. *Diagrams. Presented by the Author.*

Oceanography—Methods. **Ekman.**

On a new Current-Meter invented by Prof. Fridtjof Nansen. By V. Walfrid Ekman. (Separataftryk af *Nyt Magazin f. Naturvidenskab*, B. 39, H. 2. Kristiania, 1901.) Size 9½ × 6, pp. 163–187. *Plates.*

Pampas. **Nordenskjöld.**

Om Pampasformationen. Af Otto Nordenskjöld. (Meddelanden från Upsala Universitets Mineralogisk-Geologiska Institution, 25.) Stockholm, 1900. Size 8½ × 5½, pp. 191–206. *Map.*

Physiography. **Herbertson.**

Outlines of Physiography. An Introduction to the Study of the Earth. By A. J. Herbertson, PH.D. London: Edward Arnold, 1901. Size 7½ × 5, pp. viii. and 312. *Illustrations. Price* 4*s.* 6*d. Presented by the Publisher.*

This text-book is intended for more elementary students than those to whom such works as Dr. Mill's 'Realm of Nature' are appropriate. It gives a clear insight into the first principles which govern the operations of nature, and should prove a valuable help, from an educational point of view, as an introduction to the study of geography.

Phyto-Geography. *Ann. G.* **10** (1901): 260–265. **Flahault.**

La Nomenclature de la Géographie botanique. Par M. Ch. Flahault.

Phyto-Geography. *Naturw. Wochenschrift* **16** (1901): 201–209. **Höck.**

Getränke-liefernde Pflanzen, ihre einstige und heutige Verbreitung und die ihrer Erzeugnisse. Von Dr. F. Höck.

Phyto-Geography. *Abh. A. W. Berlin* (1899–1900) (ii): 1–114. **Schumann.**

Die Verbreitung der *Cactaceæ* im Verhältniss zu ihrer systematischen Geilderung. Von Prof. Dr. K. Schumann. *With Maps.*

River Deltas. *Science* **13** (1901): 952–954. **Daly.**

Marine Currents and River Deflection. By Dr. R. A. Daly. *With Diagrams.*

A note on this paper appeared in the August number (p. 219).

Sea-level. *Geolog. Mag.* **8** (1901): 167–174, 223–231, 253–265. **Pearson.**

Oscillations in the Sea-level. By H. W. Pearson. *With Diagram.*

A summary of historical indications of fluctuations of sea-level.

Seismology. ———

Publications of the Earthquake Investigation Committee in Foreign Languages. No. 5 (pp. iv. and 82), No. 6. Tokyo, 1901. Size 10 × 7, pp. viii. and 182. *Charts and Plates. Presented by the President of the Imperial Earthquake Investigation Committee.*

Solar Radiation. *Meteorolog. Z.* **18** (1901): 174–176. **Angström.**

Intensität der Sonnenstrahlung in verschiedenen Höhen, nach Untersuchungen auf Teneriffa, 1895 und 1896. Von Knut Angström.

Surface Soil. *P.R.S.* **68** (1901): 253-261. **Darwin.**

On the Small Vertical Movements of a Stone laid on the Surface of the Ground. By Horace Darwin. *With Illustrations.*

On experiments to measure the downward movement of a stone due to the action of earthworms. The movements (upward and downward) due to varying moisture and to frost were found to be greater than was expected.

Waves. *P.I. Civil Engineers* **143** (1901): 210-212. **Shield.**

Notes on the Height of Waves at Peterhead, N.B. By W. Shield.

Zoogeography. **Harvie-Brown.**

On a Correct Colour Code or Sortation Code in Colours. By J. A. Harvie-Brown. (Reprinted from the 'Transactions of the Edinburgh Field Naturalists' and Microscopical Society,' Sess. 1898-99.) Edinburgh: W. Blackwood & Sons, 1899. *Again* reprinted, 1900. Size 8½ × 5½, pp. 41-54. *Map.*

The author suggests a colour-code for adoption for the mapping of Zoogeographical realms, etc.

ANTHROPOGEOGRAPHY AND HISTORICAL GEOGRAPHY.

Anthropology. **Sergi.**

The Mediterranean Race: a Study of the Origin of European Peoples. By G. Sergi. London: W. Scott, 1901. Size 7½ × 5, pp. xii. and 320. *Illustrations. Price* 6*s.*

Prof. Sergi's theories as to the affinities of the races of Europe and North Africa, though viewed with some suspicion at first, have now met with acceptance in many quarters, and their exposition in a convenient form in the present volume is to be welcomed.

Commercial Geography. **Foucart and others.**

Ministère du commerce, dé l'Industrie, des Postes et des Télégraphes. Exposition Universelle Internationale de 1900. Direction Générale de l'exploitation. Congrès International de Géographie Économique et Commerciale tenu à Paris du 27 au 31 Août 1900. Procés-Verbaux Sommaires. Par M. Georges Foucart, et MM. L. Marin, Colas des Francs, H. Froidevaux, G. Bourgoin, Paris, 1901. Size 10½ × 7, pp. 68.

Commercial Geography—Iron and Coal. **Atkinson.**

The Dominion of Iron and Coal. What it stands for. By Edward Atkinson. Baltimore: Manufacturers' Record, 1900. Size 8½ × 6, pp. 14. *Presented by the Author.*

The author estimates that the world's consumption of iron and steel will have risen by 1910 to at least 55,000,000 tons a year, and that 50 per cent. of this will be supplied by the United States.

Commercial Geography—Rubber. *Globus* **79** (1901): 205-206. **Neger.**

Der Stand der Kautschukgewinnung, vorzugsweise im tropischen Afrika, und die Frage der Kautschukpflanzenkultur. Von Dr. F. W. Neger.

Ethnology—Canoes. *Rep. Smithsonian I.* (1899), *U.S. National Museum.* **Mason.**

Pointed Bark Canoes of the Kutenai and Amur. By Otis T. Mason. *With Illustrations.*

A description of two forms of canoe, which, though found in different continents, are "like to each other and unlike to any other craft in either hemisphere."

Historical—Civilization. **Bense.**

The Civilising Race. By E. M. Bense. London: Simpkin & Co., 1901. Size 8 × 5, pp. viii. and 260. *Price* 12*s. Presented by the Publishers.*

Consists largely of wild speculations on the origin and early history of civilization. Historical evidence is generally either disregarded or twisted to suit the arbitrary hypotheses of the writer, who possibly does not intend the book to be taken seriously.

Historical—Cook's Voyages. **Cash.**

The Life and Voyages of Captain James Cook. Selections, with Introductions and Notes. By C. G. Cash. London: Blackie & Son, [1901]. Size 7½ × 5, pp. 192. *Price* 1*s. Presented by the Publishers.*

This is the latest issue of Blackie's "School and home library." It consists of judiciously chosen extracts from the official account of Cook's voyages.

Historical—D'Albaigne. **Hamy.**

Nouveaux Documents sur les Frères D'Albaigne et sur le projet de voyage de découvertes présenté en 1566 à la cour de France. Par M. E.-T. Hamy. (Extrait du *Bulletin de géographie historique et descriptive*, No. 1, 1899.) Paris: 1900. Size 9½ × 6½, pp. 12.

BIOGRAPHY.

Chalmers. *Miss. Record United Free Church Scotland* (1901): 253–256. **Robson.**

James Chalmers of New Guinea. By the Rev. George Robson, D.D. *With Portraits and Illustrations.*

Chalmers and Tomkins. *Chron. London Miss. S.* **65** (1901): 126–129. ——

James Chalmers and Oliver Tomkins of New Guinea. *With Portraits.*

Drygalski. *Deutsche Rundschau G.* **23** (1901): 374–376. ——

Erich Dagobert *v.* Drygalski. *With Portrait.*

Fiorini. *Riv. G. Italiana* **8** (1901): 245–260. **Bertacchi.**

Il Prof. Matteo Fiorini e la Geografia Matematica. Nota del Prof. Cosimo Bertacchi.

Prof. Fiorini, well known for his writings on cartography and allied subjects, was born in 1827 and died in January last.

Haughton. **Yate.**

Lieut.-Colonel John Haughton, Commandant of the 36th Sikhs. A Hero of Tirah. A Memoir. By Major A. C. Yate. London: John Murray, 1900. Size 9 × 6, pp. xvi. and 238. *Portrait, Maps, and Illustrations.* 12*s. net. Presented by the Author.*

This memoir presents to the British army the example of one who "personified a very high ideal of coolness, capacity for command, courage, and devotion," but whose heroic death at Shinkamar during the Tirah campaign is, the author thinks, in danger of being forgotten by the general public.

Parkes. **Lane-Poole.**

Sir Harry Parkes in China. By Stanley Lane-Poole. London: Methuen & Co., 1901. Size 8 × 5, pp. xxvi. and 386. *Portrait and Maps. Price* 6*s. Presented by the Publishers.*

This work gives, in a more concise form than the two-volume biography written by the same author in 1894, an account of the life of one of the most important actors in the history of British relations with China. As is remarked in the preface, there is very little in that history which is not illustrated by the life-work, either of Sir Rutherford Alcock (lately dealt with by Mr. Michie) or of Sir Harry Parkes, and the volume is therefore of much interest at the present time.

Ruge. *Geogr. Anzeiger, Pet. Mitt.* **2** (1901): 33–35. **Partsch.**

Sophus Ruge, von Prof. Dr. Partsch.

GENERAL.

British Colonies. ——

Combined Circulars on Canada, the Australasian and South African Colonies. Issued by the Emigrants' Information Office. January, 1901. Size 8½ × 5½, pp. 18, 46, 16. *Sketch-maps.*

British Colonies—Coal. *Rev. Française* **26** (1901): 281–288. **Barré.**

La Houille dans les Colonies Anglaises. Par Paul Barré.

British Empire. **Lee.**

Britain over the Sea. A Reader for Schools. Compiled and Edited by Elizabeth Lee. London: John Murray, 1901. Size 8 × 5¼, pp. xlvi. and 238. *Maps. Price* 2*s.* 6*d. Presented by the Publisher.*

The compiler has carried out the excellent idea of bringing together for educational purposes a selection of extracts from standard writers, all bearing on the principles and history of British Colonial expansion. The authors put under contribution range from Bacon to Lord Beaconsfield, while a limited number of extracts from the writings of Mungo Park, Livingstone, etc., give an insight into the conditions under which the work of extending British influence has been performed. This side of the question might perhaps with advantage have been more comprehensively dealt with, but taken as a whole the selection has been made with much judgment.

Congress. ——

Verhandlungen des Siebenten Internationalen Geographen-Kongresses, Berlin, 1899. 2 vols. Berlin: W. H. Kühl, 1901. Size 10 × 6½, pp. (vol. i.) xiv. and 465; (vol. ii.) xvi. and 982. *Maps and Diagrams. Presented by the Congress.*

The report of the Berlin meeting of the International Geographical Congress is presented in two handsome volumes, of which the first is devoted to the proceedings at the meetings of the Congress, the second gives the text of the papers read, one hundred and twenty-four in all, illustrated by a considerable number of maps and diagrams.

Geography. **Claparède.**

Coup d'œil sur la Géographie et ses divisions en général et sur la Géographie Economique et Sociale en particulier. Par Arthur de Claparède. Genève, 1901. Size 7½ × 5, pp. 30.

The writer adopts, as the best yet supplied, the definition of geography given by Dr. Mill in the 'International Geography.'

Geography. *T. and Ninth Annual Rep. Liverpool G.S.* (1900): 42–52. **Wilkinson.**

On the Means of Popularising Geography as a Study. By F. J. Wilkinson.

Geography and History. **George.**

The Relations of Geography and History. By the Rev. H. B. George, M.A. Oxford: the Clarendon Press, 1901. Size 8 × 5½, pp. viii. and 296. *Maps. Price 4s. 6d. Presented by the Clarendon Press.*

This will be specially noticed.

Lisbon Geographical Society. ——

Boletim da Sociedade de Geographia de Lisboa. Numero commemorativo do 25° anniversario da Sociedade. Abril de 1901. Lisboa, 1901. Size 10 × 6½, pp. 84. *Illustrations.*

Malarial Fever. **Stephens, Christophers, and Daniels.**

Reports to the Malaria Committee of the Royal Society. Fifth Series. London: Harrison & Sons, 1901. Size 8½ × 5½, pp. 78. *Diagrams. Presented by the Royal Society.*

This series includes reports on the proposed site for European residents in the Freetown Hills, which, it is hoped, on account of its dryness, and by the exclusion of native dwellings, will prove free from malaria; on the distribution and breeding-grounds of *Anopheles* in British Central Africa; and on blackwater fever both in East and West Africa.

Metric System. ——

Commercial. No. 1 (1901). Reports from Her Majesty's Representatives Abroad on the Metric System. Part ii. London: Eyre & Spottiswoode, 1901. Size 10 × 6, pp. 34. *Price 2½d.*

Gives information as to the adoption and working of the metric system in various foreign countries.

Mountain Sickness. *Alpine J.* **20** (1901): 368–393. **Hepburn.**

The influence of High Altitudes in Mountaineering. By Malcolm L. Hepburn, M.D.

An attempt to put together for the use of mountaineers the experience so far acquired by climbers and others on the subject of so-called mountain-sickness. The writer urges the need of caution in ascribing *all* the symptoms experienced to the effect of altitude only.

Population of the Earth. **Supan.**

Die Bevölkerung der Erde . . . Herausgegeben von Alexander Supan. XI. Asien und Australien samt den Südsee-Inseln. (Dr. A. Petermanns Mitteilungen.

Ergänzungsheft No. 135.) Gotha: Justus Perthes, 1901. Size 11 × 7½, pp. 108. *Map. Price* 6 *m.* 40 *pf.*

A new issue of this indispensable publication will be welcomed by statisticians.

Portuguese Colonies. *Questions Dipl. et Colon.* 11 (1901): 531–536. **Hauser.**

Études sur les colonies portugaises.—V. L'empire portugais: conclusion. Par M. le Prof. H. Hauser.

Portuguese Colonies—Railways. ———

Album de Estatistica Graphica dos Caminhos de Ferro Portuguezes das Provincias Ultramarinas, 1898. Lisboa: Companhia Nacional Editora. Size 15 × 10½, pp. xii. *Diagrams and Map.*

The statistics of the Portuguese Colonial Railways are illustrated by a variety of graphic methods, maps of the railways being also given.

Rumanian Geographical Society. *B.S.G. Română* 21 (1900): 1–34. ———

Serbarea Jubileului 6/19 si 7/20 Decemvrie 1900. 1875—Junie 15—1900. *With Plate.*

On the proceedings in celebration of the twenty-fifth anniversary of the founding of the Rumanian Geographical Society.

Telephotography. *Alpine J.* 20 (1901): 393–403. **Shea.**

Telephotography. By Charles E. Shea. *With Illustrations.*

The writer considers that the telephotographic lens has placed in the hands of the photographer a power the complete extent of which is not fully realized.

Travel. **White.**

Pacific Tours and Around the World. By Trumbull White. Chicago, 1900. Size 8 × 6, pp. 206. *Maps and Illustrations. Presented by the American and Australian Line.*

NEW MAPS.

By E. A. REEVES, *Map Curator*, R.G.S.

EUROPE.

England. **Bartholomew.**

Bartholomew's Cyclists' Road Map of the Manchester and Liverpool Districts. Scale 1 : 126,720 or 2 stat. miles to an inch. Reduced from the new revised Ordnance Survey. J. Bartholomew & Co., Edinburgh. *Price* 1*s.* 6*d.* mounted on cloth. *Presented by the Publishers.*

The area included in this map is approximately from Leeds on the north to Wrexham on the south, and from Flint on the west to Sheffield on the east. All important roads are coloured brown, and in addition to contour lines, heights are given in figures. Generally speaking, this map is similar in style to the other sheets of Bartholomew's Reduced Ordnance Survey series, except that no orographical colouring is given, which is certainly to be regretted. However, it is doubtless in great measure owing to this fact that it has been possible to publish it for such a small sum.

England and Wales. **Ordnance Survey.**

Ordnance Survey of England and Wales:—Revised sheets published by the Director-General of the Ordnance Survey, Southampton, from July 1 to 31, 1901.

1-inch:—

With hills in brown or black, 139, 157, 180, 210, 230 (engraved). 1*s. each*; printed in colours, 212, 1*s.*; 230 and 247 (combined), 1*s.* 6*d.*

Towns and country around or districts, with roads printed in colour, Buxton, Chatham, Swansea, Tunbridge Wells. 1*s.* 3*d. each.*

6-inch—County Maps:—

Bedfordshire, 23 N.E., S.E., 26 S.E., 27 N.E., 30 N.W. **Carnarvonshire,** 28 S.W., 35 S.W. **Cumberland,** (1 S.W. and 3 N.W.), 1 S.E., 2 N.W., (2A S.E. and 3 S.W.), (3 N.W. and 1 S.W.), (3 S.W. and 2A S.E.), 5 S.E., (5A N.E. and 6 N.W.), 5A S.E., (6 N.W. and 5A N.E.), 6 N.E., S.W., 7 N.W., N.E., S.W., S.E., 9A N.E., S.E., 10 N.W., 11 N.W., 11 N.E., 11 S.W., S.E., 13 S.W., 16 N.E., 19 S.W., 29 S.E., (58 S.E. and 66 N.E.). **Derbyshire,** 46 S.W., 47 S.E., 49 S.W., 50 N.E., 54 S.E., 55 N.W., N.E., 56 N.W., S.W. **Glamorganshire,** 13 S.W., 20 N.W., S.W., 29 N.W., 43 N.W. **Merionethshire,** 3 S.W., 11 S.W. **Monmouthshire,** 17 S.W., 22 N.W., S.W., 27 N.W. **Northamptonshire,** 1 S.E., 1A S.W., 2 N.E., S.E., 3 N.W., 4 N.W., S.W., 5 S.E., 6 N.E., 7 S.W., S.E., 8 N.E., S.E., 9 N.W., S.W., 10 S.W., 11 N.W., N.E., 12 N.W., 13 N.E., (19 N.E. and 20 N.W.), (21 S.E., 22 N.W. and S.W.), 27 N.E., S.E., 35 N.E., S.E., 42 N.E., S.W., 45 S.W., 49 N.W. **Nottinghamshire,** 37 S.W., 38 S.W., 41 N.E., 44 S.E., 45 N.W., S.W., 46 S.E., 48 N.W., 49 N.W., (49 S.E. and 52 N.E.). 50 S.E., 51 N.E. (51 S.W. and S.E.), (52 N.E. and 49 S.E.). **Staffordshire,** 26 S.E. **Wiltshire,** 25 S.W., 32 N.E., S.E., 33 S.W., 38 N.W., 40 N.E., S.W., 53 S.W., S.E., 54 N.W., N.E., S.W., 59 N.W., N.E., S.W., 60 S.E., 61 S.W. 1*s. each.*

Borough of Birkenhead in one sheet. 2*s.*

25-inch—County Maps:—

Bedfordshire, I. 10, 11, 12, 14, 15, 16; II. 13; III. 7, 11, 12, 15, 16; IV. 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 16; V. 1, 5, 6, 7, 9, 10, 11, 13, 14; VI. 3, 4, 7, 8, 10, 11, 12, 14, 15, 16; VII. 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 15; VIII. 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13, 14, 16; IX. 1, 9, 10, 13; XI. 12, 15, 16; XVI. 3, 4; XVIII. 1, 10. **Cardiganshire,** I. 4, 15, 16; II. 1. **Derbyshire,** LVII. 2, 5, 6, 13, 14; LVIIA. 4. **Huntingdonshire,** (VIII. 12 and IX. 9); VIII. 16; (IX. 9 and VIII. 12); IX. 13; XII. 4, 11, 13, 15, 16; XIII. 2, 5, 6, 13 (XVI. 1 and XVIA. 4); XVI. 2, 4; (XVI. 5 and XVIA. 8); XVI. 6, 7, 8, 9, 10, 11, 12, 13, 15; (XVIA. 4 and XVI. 1); (XVIA. 8 and XVI. 5). **Merionethshire,** XV. 8; XXI. 16; XXXVI. 6; XXXVIII. 8; XXXIX. 1; XLI. 16; XLII. 15; XLIII. 3, 5, 6; XLVI. 16; XLVII. 3, 6, 7, 9, 10, 11, 13, 14; XLVIII. 4; XLIX. 1. **Monmouthshire,** V. 5, 10, 13, 14; VI. 14; VIII. 1, (2 and 3), 5, 6, 7; (VIII. 8 and IX. 5); VIII. 9, 11, 12; (IX. 5 and VIII. 8); XI. 6, 7. 13, 14, 15; XII. 9, 13; XIII. 12, 16; XVII. 3; XVIII. 6, 12, 14, 15; XIX. 2, 7, 9, 11, 16; XXII. 3, 4, 7; XXIII. 2, 4, 5, 6, 10, 14; XXIV. 3, 5, 12, 13, 15, 16; XXVII. 3; XXVIII. 1, 2, 6, 7; XXIX. 1, 2, 3, 4, 6, 11. **Montgomeryshire,** IV. 4, 12, 13, 15, 16; V. 1, 2, 6, 7, 9, 10, 11, 13, 14, 15, 16; VI. 14; VII. 4; VIII. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16; IX. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 13, 14, 15, 16; X. 1, 2, 5, 7; XII. 4, 12; XIII. 4, 5, 6, 11; XIV. 1, 2, 3, 6; XIX. 3, 5, 6, 7; XXI. 11; XXV. 7, 11, 13, 14; XXXII. 1. **Shropshire,** III. 11, 12, 15; V. 4, 7, 13, 15; VA. 16; VII. 4, 7; VIII. 10, 12; IX. 2, 3, 5, 6, 9; XI. 4, 7, 8, 11, 12, (15 and 16); XII. 9; XVIII. 3, 4; XIX. 1, 5. **Staffordshire,** XXIX. 3, 9, 10, 13, 14, 15, 16; XXX. 1, 8, 12, 16; XXXI. 6, 10; XXXII. 1; XXXVII. 2, 3, 4, 12, 13; XXXVIII. 2, 3, 4, 5, 6, 7, 8, 11, 12, 15, 16; XXXIX. 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16; XL. 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13, 14, 15; XLI. 5, 13, 14. **Wiltshire,** LVI. 4, 8, 11, 15, 16; LVII. 9, 13; LVIII. 13; LXII. 3, 4; LXIII. 1, 2, 3, 4, 6, 7, 8, 11; LXIV. 1; LXVI. 7, 9, 10, 14; LXVII. 13, 14; LXIX. 5, 9, 14; LXXI. 2, 3, 4, 12, 16; LXXII. 2, 3, 5, 6, 7, 9, 13; LXXIV. 3, 7; LXXVI. 1, 4, 8. 3*s. each.*

4 miles to 1 inch:—

14 (engraved). 1*s.* 6*d.*

County maps with roads printed in colour:—(Anglesey, Carnarvonshire, Denbighshire, Flintshire, and Merionethshire); (Cardiganshire, Carmarthenshire and Pembrokeshire); Carnarvonshire, see Anglesey; Cornwall; (Cumberland and Westmorland); Devonshire; Dorset, see Somerset; Denbighshire, see Anglesey; Flintshire, see Anglesey; (Glamorganshire and Monmouthshire); Merionethshire, see Anglesey; (Norfolk and Suffolk); Monmouthshire, see Glamorgan; Pembrokeshire, see Cardiganshire; (Somerset and Dorset); Suffolk, see Norfolk; Westmorland, see Cumberland; Yorkshire (western half), Yorkshire (eastern half). 9*d. each.*

(*E. Stanford, London Agent.*)

Iceland. **Thoroddsen.**

Uppdrattur Islands. Scale 1: 600,000 or 9·5 stat. miles to an inch. Th. Thoroddsen, 1900. Axel E. Aamodt, Copenhagen.

Dr. Thoroddsen has spent a considerable portion of his time since 1881 in Iceland, where he has travelled extensively and performed most useful topographical and

geological survey work, in recognition of which he was, in 1897, awarded the Cuthbert Peek grant of this Society. Several maps and papers, giving the results of Dr. Thoroddsen's surveys, have appeared from time to time in *Petermanns Geographische Mitteilungen*, and a map of the whole island by him, with a paper, appeared in the *Geographical Journal* for May, 1899; but that now published is on a much larger scale, and in certain parts gives more details than the one prepared by this Society. In some respects it is, however, not so complete, and there are districts where names of streams and other details are given on the former, but which do not appear on the present map. Then, again, there are no altitudes given on this map, which surely is an oversight, as they would have added considerably to its value.

In addition to the surveys of Dr. Thoroddsen, the well-known map of Gunnlaugson, of the early part of the last century, and the Admiralty charts, have been utilized in the compilation.

London. **Philip.**

Philip's Handy Volume Atlas of London. A series of 55 sectional maps (on a scale of 3 inches to the mile) of the County of London, with 12 special maps and plans, a directory of public buildings, &c., and a complete index. 3rd edition. London: George Philip & Son, 1901. *Price 5s.*

This is the third edition of a very portable plan of London, in atlas form, the first edition of which appeared in 1891. Although the date of publication of this edition is given as 1901, this is somewhat misleading, as in several districts it is behind the time, and it is to be regretted that more care has not been taken with the revision.

Russian Empire. **Petermanns Geographische Mitteilungen.**

Neue Klimakarten des Russischen Reiches, nach dem *Atlas climatologique de l'Empire de Russie*, 1900. 1. Luftdruck im Jahresmittel, im Januar, im April, im Juli, im Oktober.—Temperatur im Jahresmittel, im Januar, im April, im Juli, im Oktober.—2. Absolute Temperatur-Maxima, Gefrierdauer des Gewässer, jährlicher Niederschlag, Niederschlag im Winter, im Früling, im Sommer, im Herbst. *Petermanns Geographische Mitteilungen*, Jahrang 1901, Tafels 11 und 12. Gotha: Justus Perthes. *Presented by the Publisher.*

Eighteen maps, on two sheets, illustrating the meteorological phenomena of the Russian Empire, according to the new Climatological Atlas of the Nicolas Central Physical Observatory, St. Petersburg, which was noticed in the June number of the *Geographical Journal* for this year.

ASIA.

Palestine. **Smith and Bartholomew.**

Topographical and Physical Map of Palestine, by J. G. Bartholomew, F.R.S.E. Edited by G. A. Smith, D.D., LL.D. Scale 1: 253,440 or 4 stat. miles to an inch. Edinburgh: T. & T. Clark, 1901. With an index. *Presented by the Publishers.*

This is the map which was noticed in the July number of this journal for this year, with the addition of a very useful index to place-names. It is now published by Messrs. T. & T. Clark, of Edinburgh.

AFRICA.

West Africa. **Philip.**

Philip's Gold-field Map of West Africa. Scale 1: 126,720 or 2 stat. miles to an inch. Tarkwa sheet. London: George Philip & Son, 1901. *Price 10s. a sheet.*

This is the first sheet that has been issued of Philip's gold-field map of West Africa, and includes the region between the coast and 5° 50′ N. lat., and 1° 30′ and 2° 19′ W. long. A list of the principal authorities upon which the map is based is given, and as a general map it will be useful for reference, although in parts it may not be very reliable on account of the scanty information obtainable. It is to those who are interested in gold-mining in the district that it will principally appeal, for all concessions and claims are clearly laid down and distinguished by different colours, and much other information given that will be of special importance to those who are concerned in the development of the gold-mines. The new railway from Sekondi to Tarkwa, as laid

down on this sheet, differs considerably in detail from that given on the map on a larger scale mentioned below, which has just been issued by the consulting engineers of the line.

West Africa. **Shelford & Son.**

Plan of Railway from Sekondi to Tarkwa. Shelford & Son, consulting engineers. Scale 1 : 63,360 or 1 stat. mile to an inch. London : E. Stanford. *Price* 2*s.* 6*d.* *Presented by the Publisher.*

Shows the direction of the line and the rivers, streams, and villages in its immediate vicinity. Along the line figures are given at mile intervals, showing the distance from Sekondi.

AMERICA.

United States. **Rand, McNally & Co.**

Rand, McNally & Co.'s Indexed County and Township Pocket Map and Shippers' Guide of Arizona. Scale 1 : 1,774,080 or 28 stat. miles to an inch. Arkansas and Alabama. Scale 1 : 823,680 or 13 stat. miles to an inch. Chicago and New York : Rand, McNally & Co., 1901. *Price* $0.25 *each. Presented by the Publishers.*

These are new editions of Rand, McNally & Co.'s pocket maps of the United States. The index to places which each contains is very useful for reference.

AUSTRALASIA.

New Zealand. **Surveyor-General's Office, Wellington.**

Maps of the North and Middle (South) Islands of New Zealand. Scale 1 : 633,600 or 10 stat. miles to an inch. Surveyor-General's Office, Wellington. *Price* 8*s. each.*

Each of these two maps consists of four sheets, which overlap one another considerably. They are photo-lithographs in black and white, and must be looked upon as outlines only, no attempt being made to show hill-shading, although numerous altitudes are given in figures. Stewart Island is also shown, and several of the neighbouring islands of the Pacific are given as insets.

SOUTH POLE.

South Polar Regions.. **Stanford.**

South Polar Chart, with contours showing depth in fathoms. London : E. Stanford. 1901. *Price* 3*s.* 6*d. Presented by the Publisher.*

Mr. Stanford's chart of the South Pole and surrounding regions ought to meet with a ready welcome, especially at the present time when so much attention is directed to that quarter of the globe. It includes the whole area between lat. 30° S. and the South Pole, and thus shows not only the Antarctic region and lands in the immediate vicinity of the South Pole, but the surrounding oceans and portions of the continents of South America, Africa, and Australia, together with the whole of New Zealand. With regard to the lands immediately surrounding the pole, care has evidently been taken to distinguish between those which are laid down from more or less reliable and definite information, and those for which there is little or no authority, but which nevertheless appear on many charts without anything to show that they are merely hypothetical. This is especially the case with land supposed to have been discovered by Commander Wilkes of the U.S. Exploring Expedition in 1840, a good deal of which is very properly shown on this chart by dotted lines only, and left uncoloured. Knox Land might perhaps have been named and coloured, as Wilkes's expedition was within a very few miles of it, and from evidence obtained there is very little doubt that land does exist in this locality. The furthest south points of the principal expeditions are indicated, and several tracks also laid down. The work of recent expeditions appears to have been made use of so far as the small scale of the chart admits, although the coast-line of South Victoria Land does not agree in some respects with that laid down on Borchgrevink's chart. Ocean depths are shown by tints of blue, combined with contour lines, whilst the land is coloured brown.

CHARTS.

Admiralty Charts. **Hydrographic Department, Admiralty.**

Charts and Plans published by the Hydrographic Department, Admiralty, May and June, 1901. *Presented by the Hydrographic Department, Admiralty.*

No.	Inches.	
2401	m = 2·75	Sea of Marmara:—Buyuk Chekmejeh bay. 1*s.* 6*d.*
3206	d = 1·6	Antarctic ocean, Sheet VIII. 2*s.* 6*d.*
3177	d = 1·1	South polar chart. 2*s.* 6*d.*
3205	m = 0·1	South Shetlands and adjoining islands and lands. 2*s.* 6*d.*
3202	m = 2·0	Plans of anchorages on the west coast of Newfoundland:—Bear cove. Red island road. Ship cove. 1*s.* 6*d.*
635	m = 3·5	Cuba:—Port Banes. 1*s.* 6*d.*
2820	m = 2·4	United States, south coast:—Entrance to Pensacola bay. 2*s.* 6*d.*
3161	m = 3·0	Africa, west coast:—River Congo, Camoens point to Princes island. 2*s.* 6*d.*
1845	m = 1·2	Bay of Bengal:—Moulmein river and approaches. 2*s.* 6*d.*
3190	m = 3·0	Andaman islands:—Temple sound. 1*s.* 6*d.*
3193	m = {3·0 / 2·1}	Philippine islands:—Port Sebú. Tinaan anchorage. 2*s.*
3153	m = 1·4	Japan, Inland sea:—Manuyama zaki to Ominase. 2*s.* 6*d.*
3199	m = var.	Anchorages in the Solomon islands:—Islands in Manning strait. Allardyce harbour. Ko rig ko lai bay. Southern portion of the Lord Howe islands. 1*s.* 6*d.*
467		Plans on the coast of Chile, plan added:—Caleta Junin.
2889		Plans on the coast of Peru, plan added:—Salaverry road.
1294		Plans on the coast of Peru, plan added:—Huanchaco road.
1141		Islands in the North Pacific, plan added:—Lisiansky island.

(*J. D. Potter, Agent.*)

Charts Cancelled.

No.	Cancelled by	No.
2401 Buyuk Chekmejeh bay.	New plan. Buyuk Chekmejeh bay	2401
423 Plan of Port Banes on this sheet.	New plan. Port Banes	635
1285 Plan of Salaverry road on this chart.	New plans. Salaverry road on this chart	2889
2820 Entrance to Pensacola bay.	New plan. Entrance to Pensacola bay	2820
1845 Moulmein river.	New chart. Moulmein river and approaches	1845
2391 Plan of Port Sebú on this sheet.	New plan. Port Sebú on this sheet	3193

Charts that have received Important Corrections.

No. 2474, Hebrides:—Barra head to Scarpa island. 1471, Ireland, east coast:—Kingston harbour. 125, Belgium:—Ostend roads. 2310, Norway, west coast:—Donnœsö to Fleina. 367, France, south coast:—Port of Cette. 1093, Italy, west coast:—Civita Vecchia. 1402, Italy, west coast:—Ports Maurizio and Oneglia. 2711, Adriatic:—Gulf of Quarnero. 2282, Arctic ocean and Greenland sea. 235, America, north coast:—Davis strait and Baffin bay. 3091, Newfoundland:—Little bay island to League rocks. 2042, Cape Breton island:—Sydney harbour. 192, United States, south coast:—Galveston entrance. 2067, British Columbia:—Harbours in Discovery passage, etc. 744, India, west coast:—Cape Ramas to Alvagudda. 754, Bay of Bengal:—Dhamra river. 2757, China sea:—Banka strait to Singapore. 2637, Celebes:—Strait of Makassar, south part. 2636, Celebes:—Strait of Makassar, north part. 951, Japan:—Kii channel to Owasi bay. 357, Japan:—Harbours in the Kii channel. 1069, Australia:—Port Jackson. 2540, New Zealand:—Arvarua or Bluff harbour.

(*J. D. Potter, Agent.*)

North Atlantic Ocean and Mediterranean Sea. **Meteorological Office, London.**

Monthly Pilot Chart of the North Atlantic Ocean and Mediterranean Sea for August, 1901. Meteorological Office, London. *Price* 6*d*. *Presented by the Meteorological Office.*

U.S. Charts. **U.S. Hydrographic Office.**

Pilot Charts of the North Atlantic Ocean for July and August, and North Pacific Ocean for August, 1901. U.S. Hydrographic Office, Washington, D.C. *Presented by the U.S. Hydrographic Office.*

PHOTOGRAPHS.

Asia Minor. **Mardon.**

Fifty Photographs of North-West Asia Minor, by E. J. Mardon, Esq., 1901. *Presented by E. J. Mardon, Esq.*

Though small in size, these are remarkably clear photographs of North-West Asia Minor. Mr. E. J. Mardon has previously presented photographs to the Society, which have been noticed in this *Journal*, and those mentioned in this list were taken by him during his most recent travels.

(1) Ismid from the railway; (2) Biledjik; (3) Typical costumes at a railway station; (4) Karahissar, with native cart in foreground; (5) Cemetery, town, and hill, with castle at Afiun Karahissar; (6) Terminus of Smyrna line at Karahissar; (7) Inn at Ushák; (8) Bridge near Ushák; (9) Hammam river, where Nshak Chivril road crosses it; (10) Houses and well, Svasli; (11) Graveyard and mosque, Svasli; (12) "Khan," or inn, at Chivril; (13) Principal street in Chivril; (14) On the march—donkey transport; (15) Euchakwa, with Ak Dagh beyond; (16) Turkoman and Turkish women; (17) Bazaar, well, and mosque, Euchakwa; (18) Water-mills and dams on outskirts of Euchakwa; (19) Turkish sportsmen; (20) Loading up donkeys; (21) Houses on hillside, Homa; (22) Western slopes of Ak Dagh; (23) Yurik tents; (24) Yurik houses and tent; (25) Yurik man and women; (26) Yurik women at a fountain; (27) Camp at Duzbel Chasma, 3770 feet; (28) Camp kitchen; (29) Top of Ak Dagh; (30) Eastern slopes of Ak Dagh; (31) Camp on east side of Ak Dagh at 4270 feet; (32) Crossing pass over the Dagh with camel transport; (33) Fort of the Maimun Dagh; (34) Unloading native cart; (35) Slopes of Maimun Dagh looking south; (36–39) Views of rocky hillside in Maimun Dagh where ibex are found; (40) Ibex and mullah; (41) Yurik cowboys; (42) Villager out ibex-shooting; (43) Tahsildar or revenue collector; (44) Sutledge village; (45) Sutledge railway station; (46) Aquaduct near Smyrna; (47) Citadella at Smyrna; (48) Smyrna from citadella; (49) View down gulf of Smyrna; (50) No title.

Egypt. **Lloyd.**

Twenty-eight Photographs taken in the neighbourhood of El Obeid, by Captain H. D. W. Lloyd. *Presented by H. D. W. Lloyd.*

Owing to the fact that this region has been for so long closed to Europeans, these photographs are of more than ordinary interest. They are small, but most of them are fairly good; and, what is very important, Captain Lloyd has taken pains to write a clear and full description of each of them.

(1, 2) Women drawing water from a tebeldi tree near Nahut; (3) Baobab tree; (4) Old Bashi Bazuk, now the salesman, Nahut; (5) Tebeldi tree at Nahut; (6) Suk (market) at Nahut; (7) Suk en Nahut; (8) Ostrich in zereiba at H. Ibrai Prim, near Foga; (9) Kitchen on the march, Bur Islam; (10, 11) Horsemen, El Obeid; (12) Messeria horsemen, El Obeid; (13) Said el Make's people, El Obeid; (14) Head sheikh of the Messeria; (15) El Obeid; (16) Wanotir, Maalia tribe; (17) S. Yasin Yusif, head sheikh, Gowama; (18) S. Nur Hussein, head sheikh of the Gimmas; (19) Women, Taiara; (20–22) Cattle at El Birka; (23–25); Shenabla women at Zereiga wells; (26) Zereiga wells; (27) Zeid cutting up water-melons for camel on the way to Foga; (28) A sheikh.

N.B.—It would greatly add to the value of the collection of Photographs which has been established in the Map Room, if all the Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.

ORDNANCE SURVEY MAPS.

THE following is a list of the various Ordnance Survey Maps of the British Isles on sale to the public, together with the prices. E. Stanford, 12, 13 and 14, Long Acre, W.C., is the London agent; there are also provincial agents in most of the important towns of England, Scotland, and Ireland. In places where no agent exists, the maps can be obtained through the principal local post offices.

1-inch Scale.

	Price per sheet. s.	d.
1. England and Wales, old series, in black, with outline and hill hachures. Size 36 × 24	2	6
Size 18 × 12	1	0
2. Ditto, outline, contours in black, latitude and longitude marked. Size 18 × 12 inches. On paper	1	0
3.*Ditto, hills hachured in brown, latitude and longitude marked. Size 18 × 12 inches. On paper	1	0
4.*Ditto, hills hachured in black, latitude and longitude marked. Size 18 × 12 inches. On paper	1	0
5.*Ditto, hills hachured in brown, contours red, roads brown, water blue, magnetic variation shown, latitude and longitude not marked. Size 18 × 12 inches. On linen-backed paper, either flat (with a few exceptions) or folded in covers. Single sheets	1	0
Combined sheets	1	6
6. Scotland, outline and contours in black, latitude and longitude marked. Size 24 × 18 inches. On paper	1	9
7.*Ditto, hills hachured in brown, and black contours, latitude and longitude marked. Size 24 × 18 inches. On paper	1	6
8. Ireland, outline, not contoured, in black, latitude and longitude marked. Size 18 × 12 inches. On paper	1	0
9. Ditto, hills hachured in black, latitude and longitude marked. Size 18 × 12 inches. On paper	1	0
10.*Combined maps of areas round certain large towns, or other areas, such as the New Forest and Lake District, and published in various forms and sizes. These maps usually show outline and contour in black and roads in brown. In sheets, unmounted	9*d.* to	1 0
Folded in cover	1*s.* to	1 6

4 Miles to an Inch.

11.*England and Wales, engraved in black, latitude and longitude marked, no hill shading or contours. Size 22½ × 15 inches. On paper	1	6
12.*County maps, cheap edition, roads in brown, latitude and longitude marked, on thin paper or folded in covers. Kent, size 22½ × 17 inches. Northumberland and Durham (combined), size 17⅜ × 23¾ inches. In sheets, unmounted	0	6
Folded in covers	0	9

6-Inch Scale.

13. Great Britain, water coloured blue or black lined, contours in black, latitude and longitude marked. Heliozincographed and photozincographed. Size 18 × 12 inches	1	0

* Publication in progress.

	Price per sheet. s.	d.
Engraved or photozincographed (where not published in quarter sheets). Size 36 × 24 inches	2	6
14. Ireland, engraved or heliozincographed, contours in black, latitude and longitude not marked. Size 36 × 24 inches	2	6

$\frac{1}{2500}$ Scale.

15. Houses ruled in black, water blue or black lined, latitude and longitude not marked. Size 38 × 25½ inches	3	0
16. Houses red, water blue, roads brown, latitude and longitude not marked. Unrevised editions only coloured in this form. Size 38 × 25½ inches. From 2s. 6d. to 23s., according to the amount of colouring. This form is gradually being superseded by 15.		

Town Scales.

17. $\frac{1}{500}$ scale, houses stippled. Size 38 × 25½	2	6
18. Ditto, houses ruled. Size 38 × 25½	2	6
19. Ditto, houses red, water blue, roads brown. Size 38 × 25½ inches. From 2s. 6d. to 15s., according to the amount of colouring. Applies to unrevised only.		
20. 5-feet scale, houses stippled. Revised. Size 36 × 24 inches	2	6

Index Maps.

21. Indexes to the sheets of the 1-inch scale maps of England and Wales, Scotland, and Ireland, scale 30 miles to an inch. Sizes about 18 × 13 inches	0	2
22.*Index to the sheets of the 6-inch scale map, parishes coloured. England and Wales. Size 18 × 12 inches	1	0
Scotland. Size 24 × 18 inches	1	9
23.*Index to the sheets of the 1 : 2500 scale map, parishes coloured. England and Wales. Size 18 × 12 inches	1	0
Scotland. Size 24 × 18 inches	1	9

Nos. 22 and 23 are identical with Nos. 2 and 6, but with sheet lines added, printed on thin paper, and coloured to show civil parishes.

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* Publication in progress.

	Price per sheet.
	s. *d.*
	2 6
	2 6
	3 0
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	1 0
	1 9
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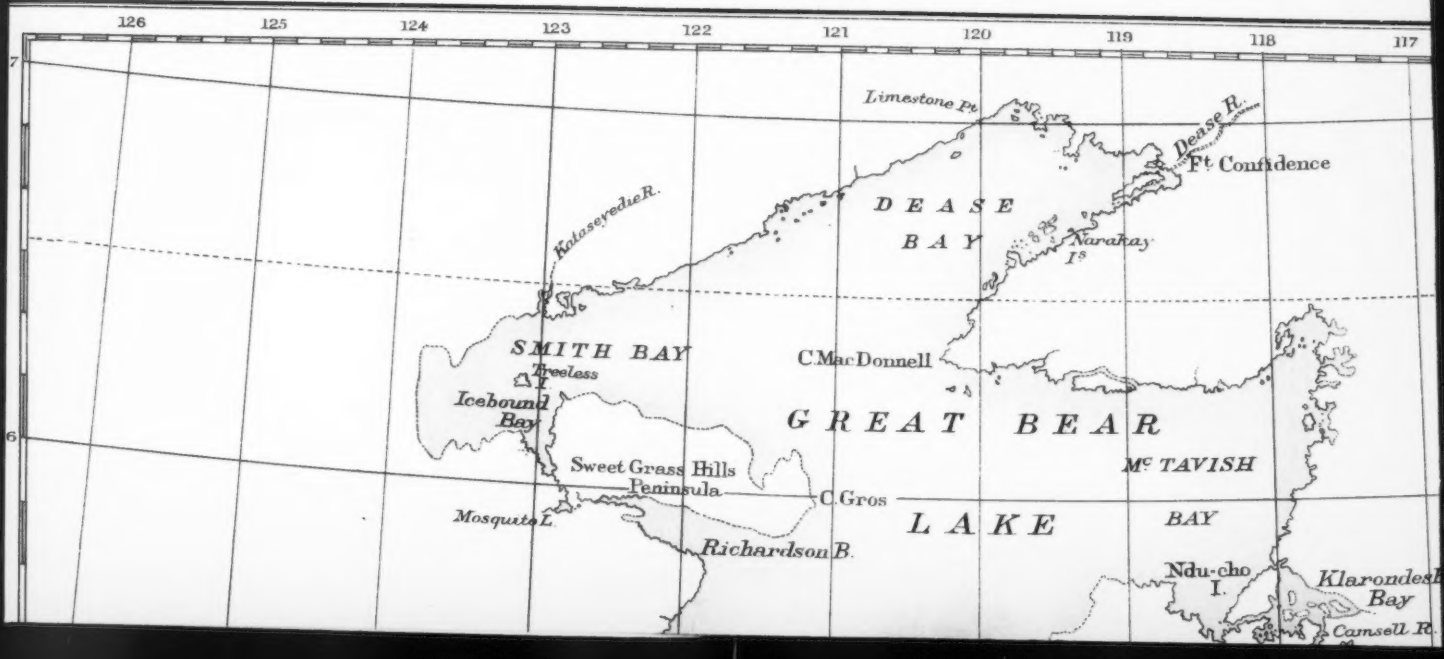
	1 9

67
66


126
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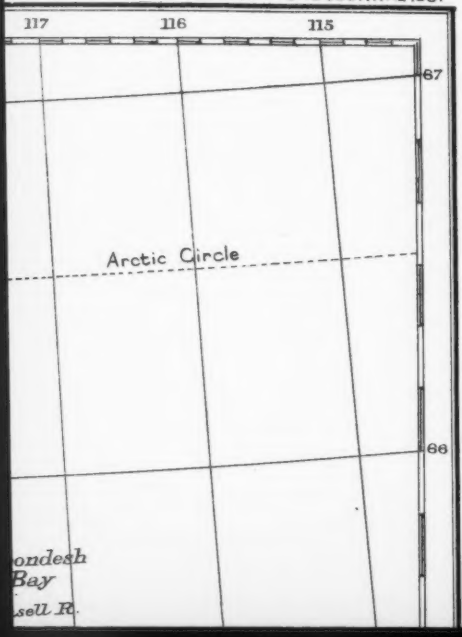
7
6
Limestone Pt.
Dease R.
Ft. Confidence
DEASE
BAY
Narañay
Is.
Kalaseyedie R.
SMITH BAY
Treeless
I.
Icebound
Bay
C. MacDonnell
GREAT BEAR
LAKE
Mc TAVISH
BAY
Sweet Grass Hills
Peninsula
C. Gros
Mosquito L.
Richardson B.
Ndu-cho
I.
Klarondesi
Bay
Camsell R.


117
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Arctic Circle
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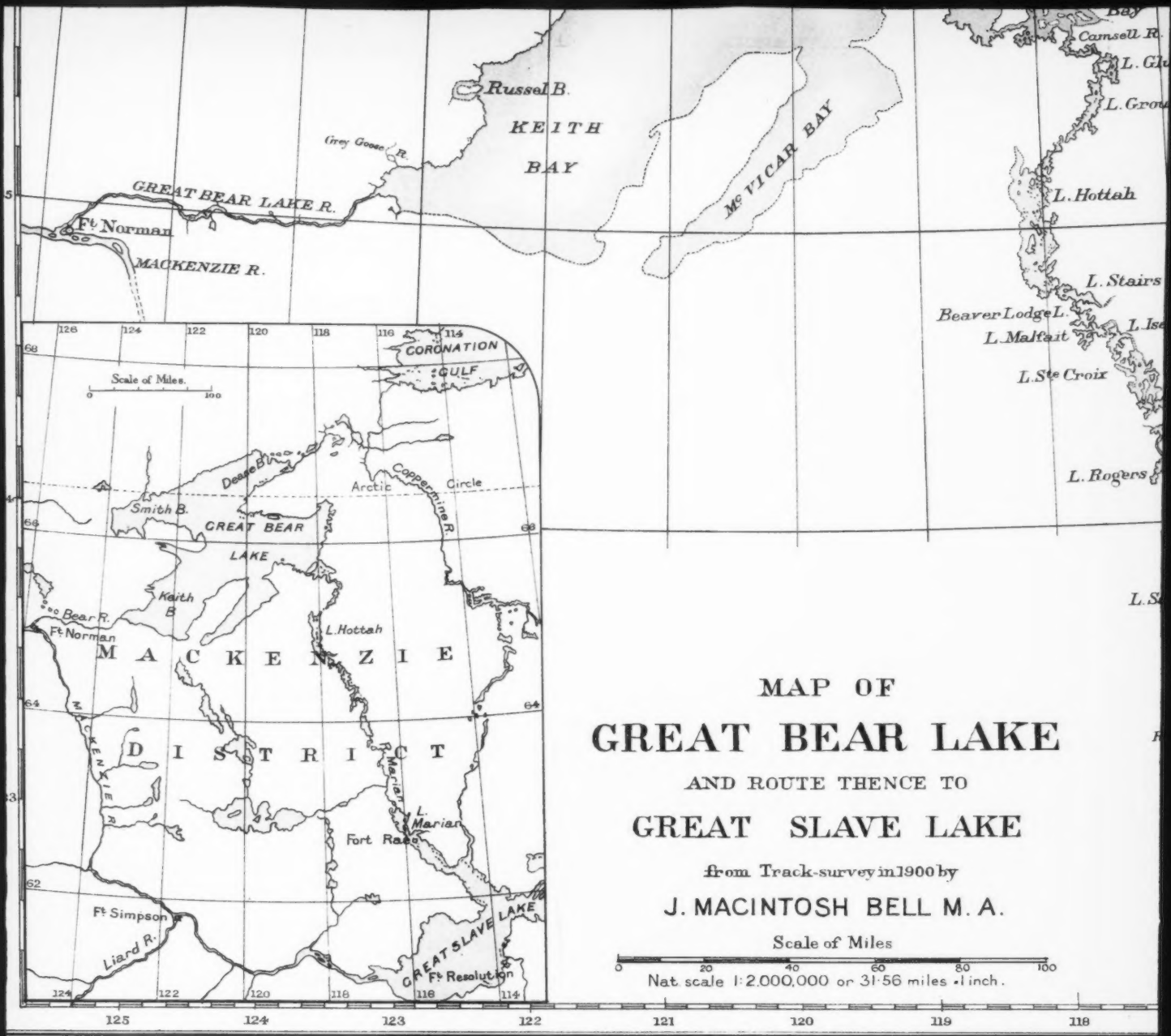


MAP OF
GREAT BEAR LAKE
AND ROUTE THENCE TO
GREAT SLAVE LAKE

from Track-survey in 1900 by

J. MACINTOSH BELL M. A.

Scale of Miles

0 20 40 60 80 100

Nat scale 1:2,000,000 or 31·56 miles = 1 inch.

Published by the Royal Geographical Society.

sell R.
L. Glut
L. Grouard
ah
65
Stairs
L. Isabella
L. Rey
L. Fabre
L. Grant
L. Rosamond
gers
64
Dawaso-necha
L.
L. Sarakh
of Land
Hagle L.
Height
MARIAN RIVER R.
L. Hislop
Petitot R.
R. La Martre
63
Lake
Marian
R. du
Brochet
Fort Rae
Part of
Great Slave L.
117
116

CLINTON
RANGE
Mt Wasehal
Tadechamdim
3052
3300
Good grass
Fresh) Eddh
Hawash R.
Gedu
Denhu
Village
Kassam R.
Lumafun
Comorotia
Serrated ridge
Sparse bush
Plains
Lakes (Soda)
40

MA

to illustrate a

ZEILA TO LA

NORTH EAS

H

JAMES J.

[accompanied by Mess^rs A.E.Butter, W

1899

Scale o

0 10 20

Natural Scale, 1:1000.

Route
Heights

This Map is based on a Sur
who accompanied Mr. Har

MAP

...e a journey from

...AKE STEFANIE.

...AST AFRICA.

by

J. HARRISON.

...r, W. F. Whitehouse & P. G. Powell-Cotton.]

...899-1900.

...le of Miles.

30 40 50 60

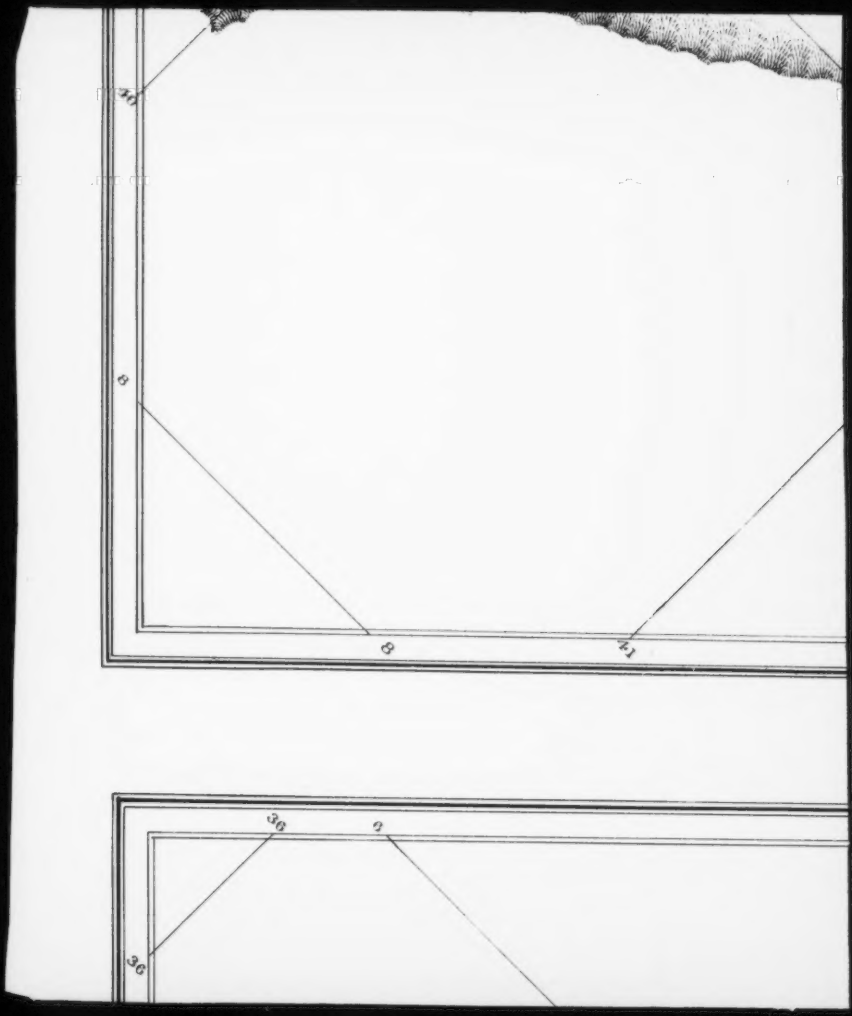
...000,000 or 15·78 miles = 1 inch.

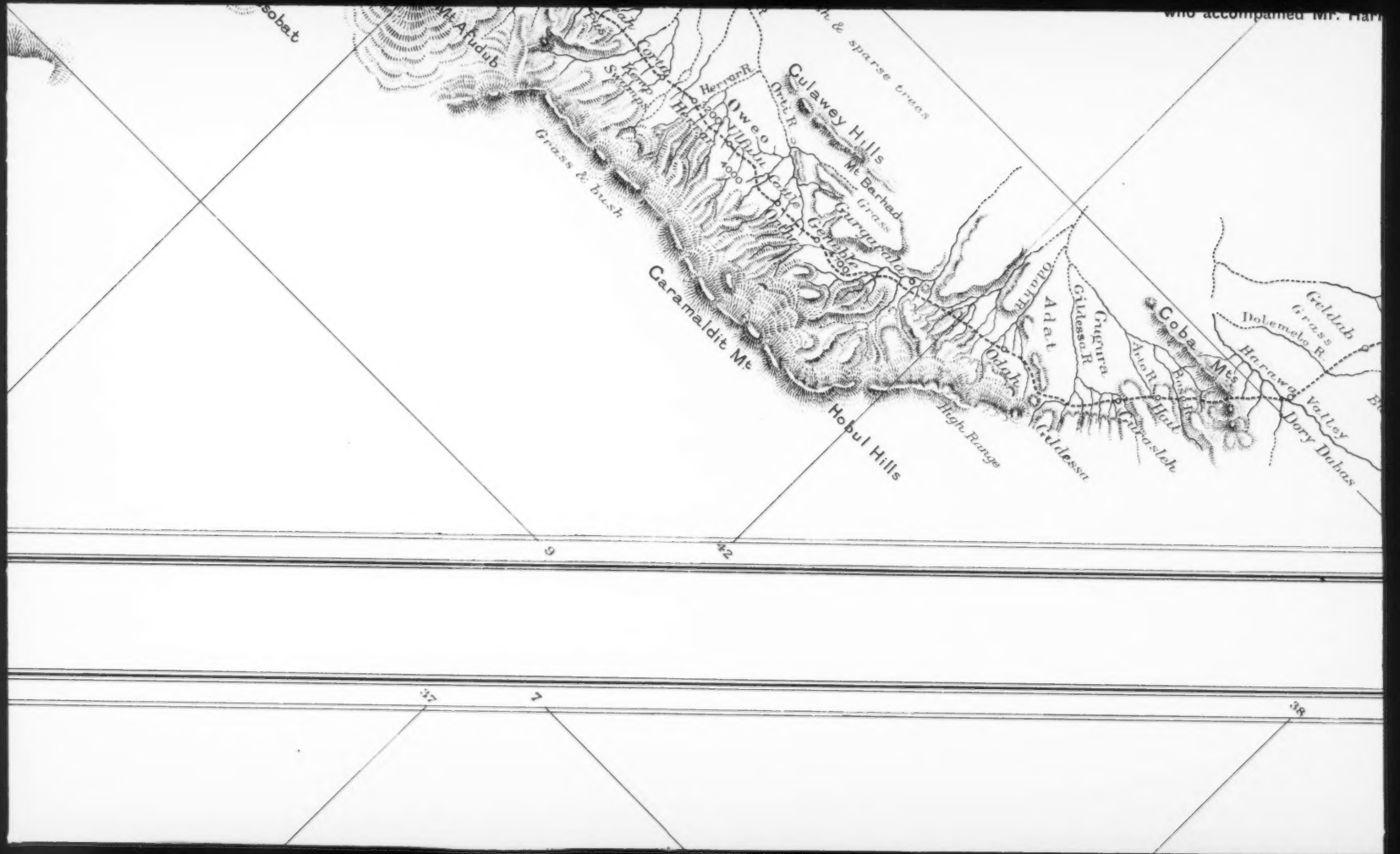
Route--------

Heights in feet.

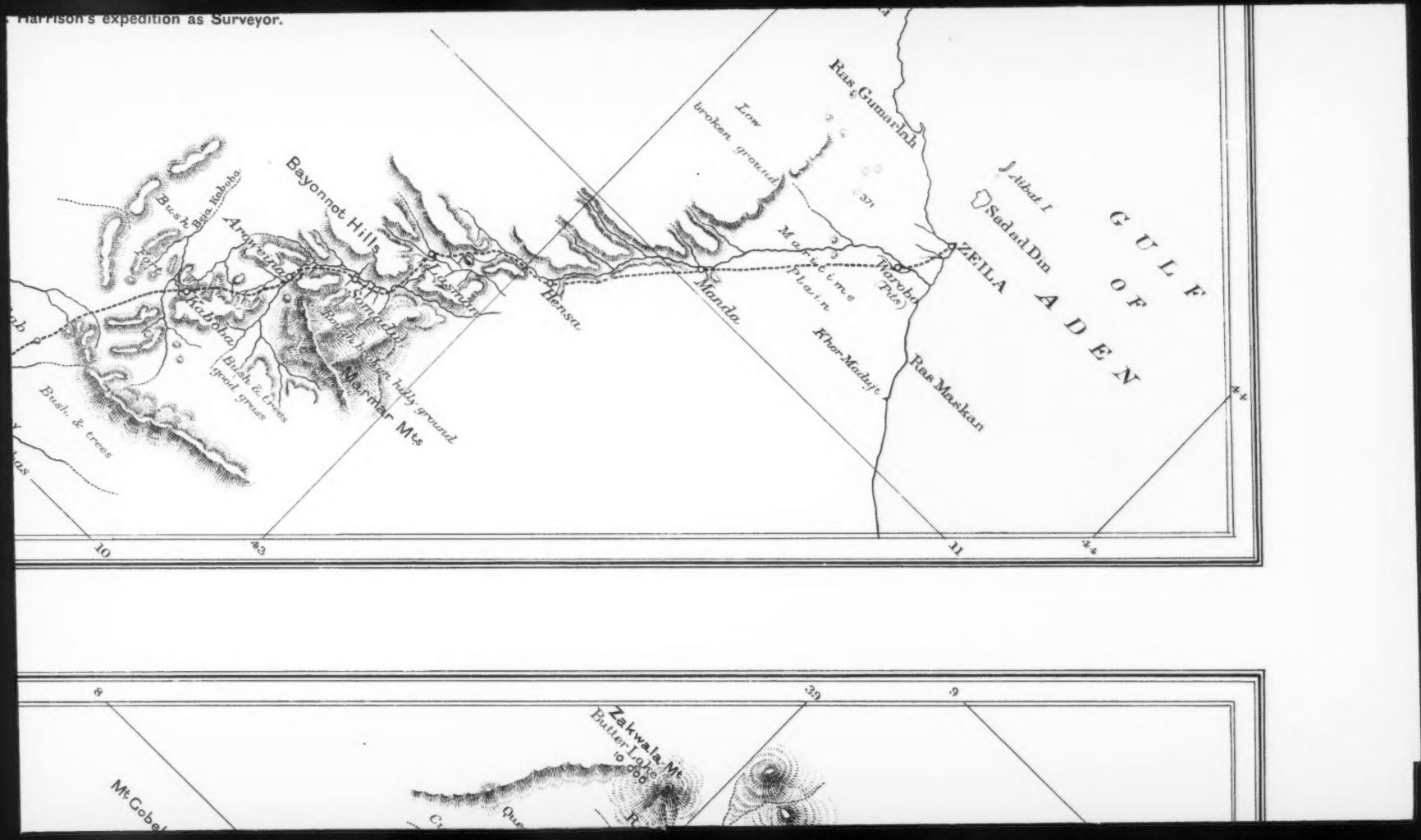
...n Survey by Sergeant D. Clarke, R.E.,

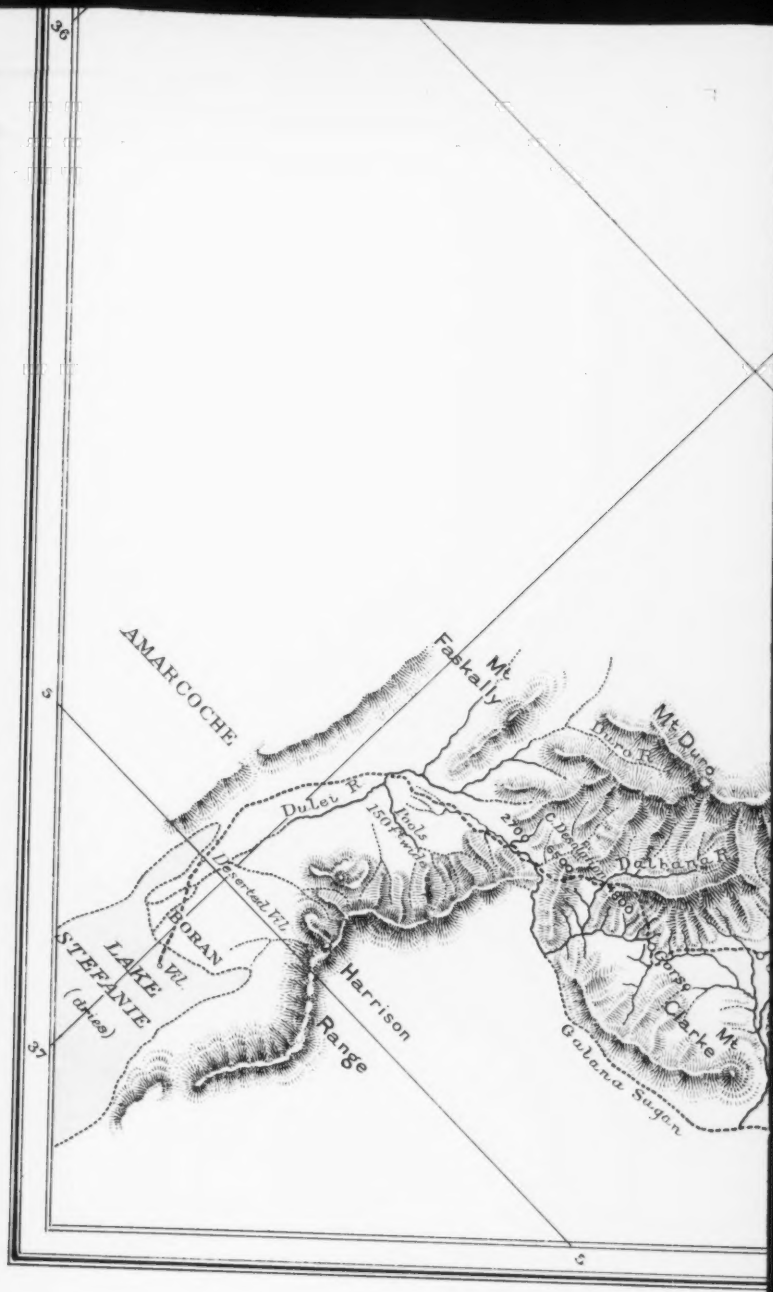
... Harrison's expedition as Surveyor.

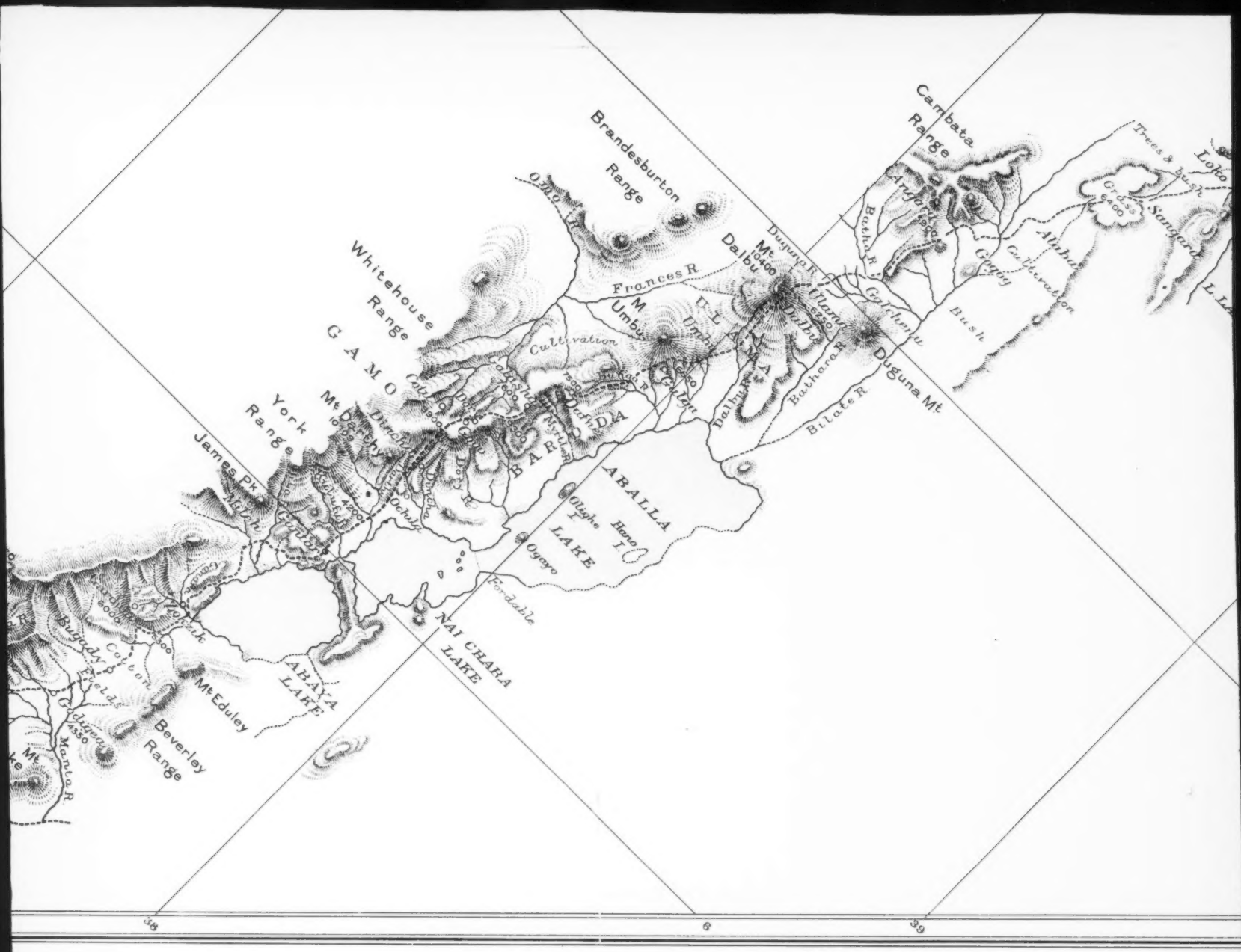

41
8
8
41
36
9
36


Who accompanied Mr. Har
Sobat
Mt. Afudub
Grass & bush
Herror R.
Owee
Culawey Hills
Mt. Barhad
Grass
Caramaldit Mt
Hobul Hills
High Range
Adat
Gilleesa R.
Guerra
Coba Mts
Geldeb
Grass
Dolemeda R.
Harawa
Valley
Dory Dubas
Geldessa
Gradwaleh
Hirit
Bush R.
Auto R.
Oladi
9
42
37
7
38

Harrison's expedition as Surveyor.




36
5
37
AMARCOCHE
Mt Faskally
Mt Duro
Duro R.
Du Lev R.
Uvala Isnjerovica
2969
Dalhane R.
Levertend Fil.
BORAN
Vil.
LAKE STEFANIE
(dries)
Harrison Range
Clarke
Mt
Galana Sugan



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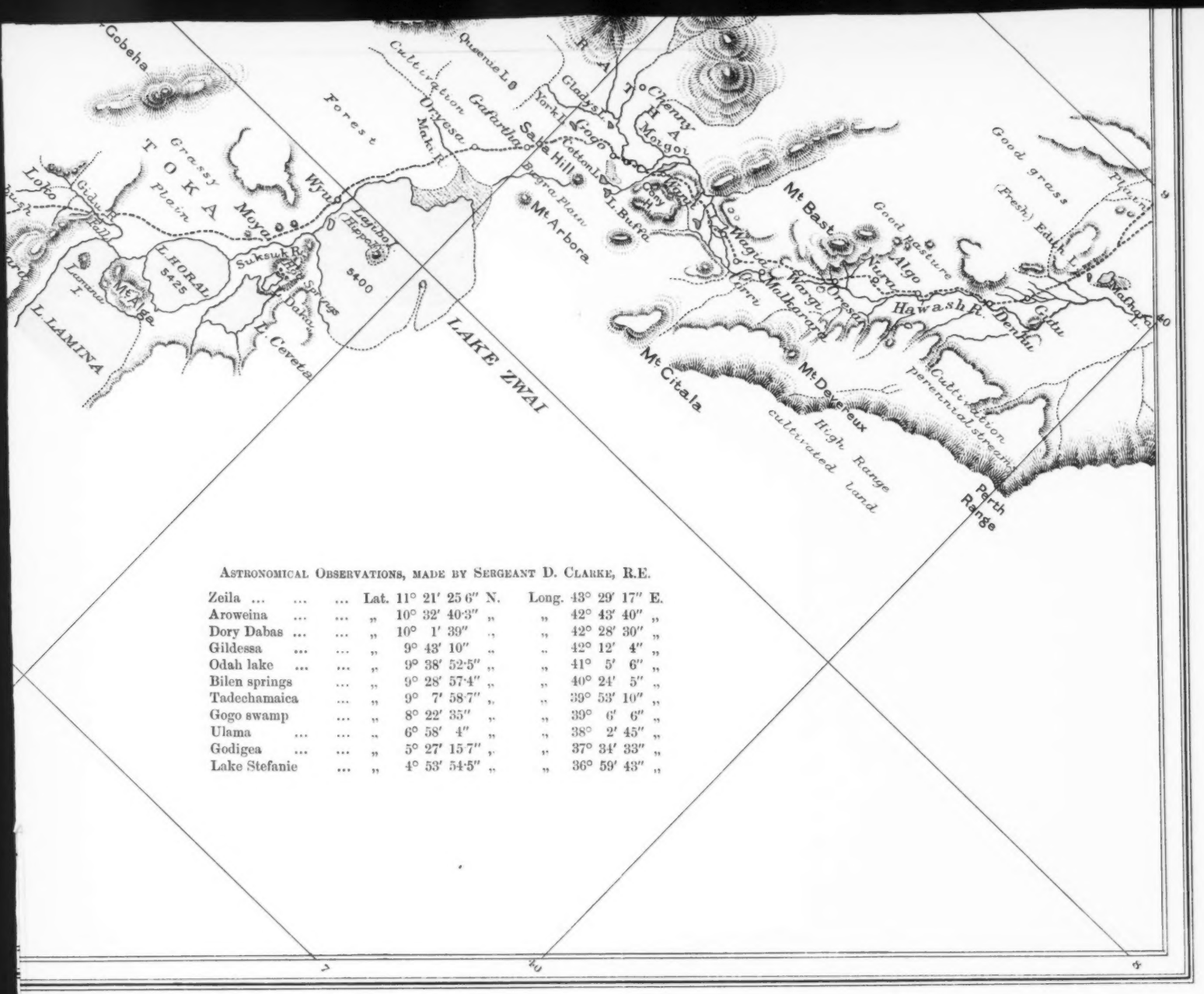
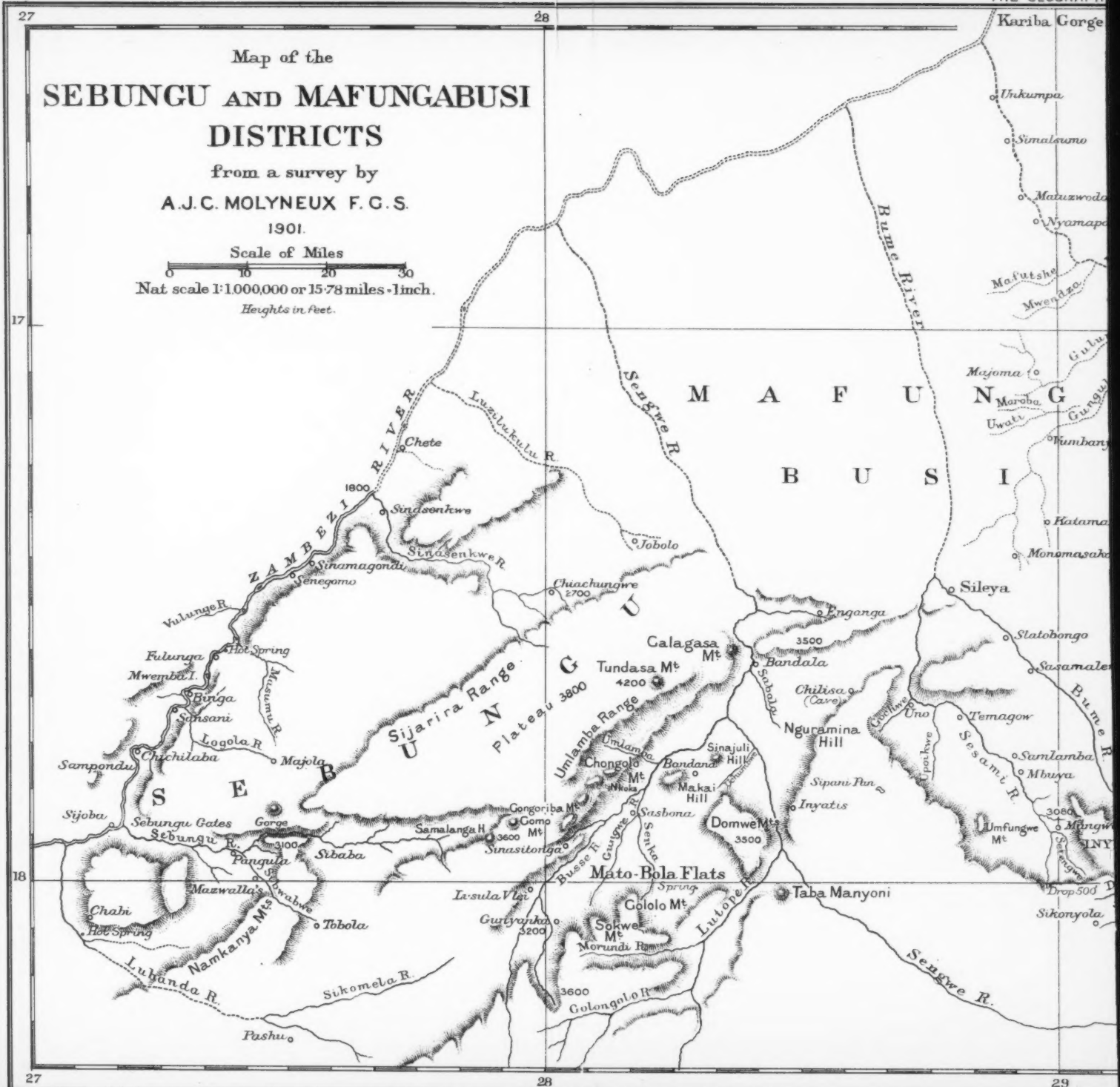
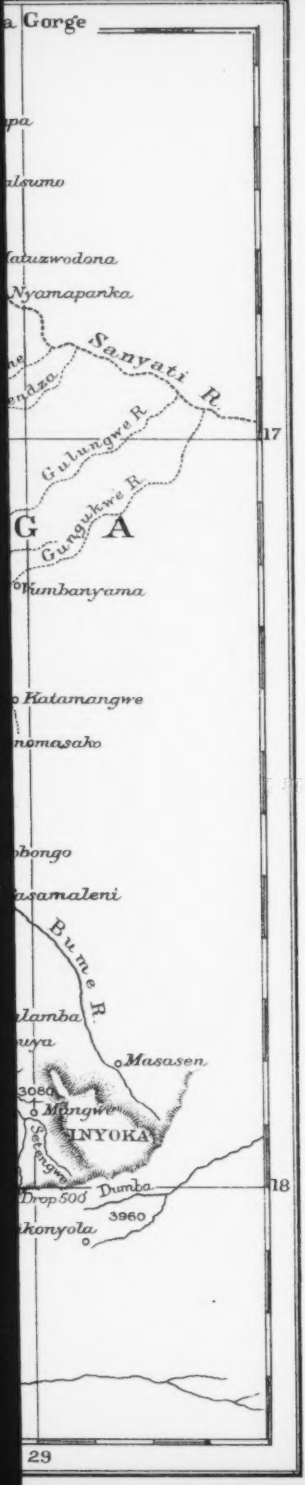


ASTRONOMICAL OBSERVATIONS, MADE BY SERGEANT D. CLARKE, R.E.

Zeila	Lat.	11°	21′	25·6″	N.	Long.	43°	29′	17″	E.
Aroweina	„	10°	32′	40·3″	„	„	42°	43′	40″	„
Dory Dabas	„	10°	1′	39″	„	„	42°	28′	30″	„
Gildessa	„	9°	43′	10″	„	„	42°	12′	4″	„
Odah lake	„	9°	38′	52·5″	„	„	41°	5′	6″	„
Bilen springs ...	„	9°	28′	57·4″	„	„	40°	24′	5″	„
Tadechamaica ...	„	9°	7′	58·7″	„	„	39°	53′	10″	„
Gogo swamp ...	„	8°	22′	35″	„	„	39°	6′	6″	„
Ulama	„	6°	58′	4″	„	„	38°	2′	45″	„
Godigea	„	5°	27′	15·7″	„	„	37°	34′	33″	„
Lake Stefanie ...	„	4°	53′	54·5″	„	„	36°	59′	43″	„

27
17
18
27


Map of the
SEBUNGU AND MAFUNGABUSI DISTRICTS
from a survey by
A.J.C. MOLYNEUX F.G.S.
1901.
Scale of Miles
0 10 20 30
Nat scale 1:1,000,000 or 15·78 miles = 1 inch.
Heights in feet.
27
28
29
17
18
Kariba Gorge
Unkumpa
Simalaumo
Matuzwoda
Nyamapa
Mafutshe
Mwenaza
Bume River
Majoma
Maroba
Uwati
Gungu
Yumbany
Katama
Monomasaka
MAFUNGABUSI
Sengwe R.
Luzilukulu R.
Chete
1800
Sindsenkwe
ZAMBEZI RIVER
Sindsenkwe R.
Sinamagondi
Senegomo
Jobolo
Chiachungwe 2700
Vulunge R.
Fulunga
Hot Spring
Mwemba I.
Binga
Sansani
Musumu R.
Logola R.
Chichilaba
Majola
Sampondu
Sijoba
Sebungu Gates
Gorge
Sebungu R.
3100
Pangula
Sibaba
Mazwalla's
Chabi
Hot Spring
Tobola
Namkanya Mts
Lubanda R.
Sikomela R.
Pashu
SEBUNGU
Sijarira Range
Plateau 3800
Umlamba Range
Umlamba
Chongolo Mt
Nkoka
Bandana
Sinajuli Hill
Makai Hill
Gongoriba Mt
Como Mt
3600
Samalanga H.
Sinasitonga
Busse R.
Guigue
Sasbona
Senka
Domwe Mts
3500
Mato-Bola Flats
Spring
Ivsula Vlei
Gololo Mt
Gutyanka
3200
Sokwe Mt
Morunda R.
Lutope R.
3600
Golongalo R.
Taba Manyoni
Galagasa Mt
Tundasa Mt
4200
Bandala
3500
Sabala
Chilisa Cave
Nguramina Hill
Enganga
Sileya
Slatobongo
Sasamale
Bume R.
Temagow
Uno
Guchiwe
Tpatwe
Sesami R.
Samlamba
Mbuya
Sipani Pan
Inyatis
Umfungwe Mt
3080
Mangw
Drop 500
Sikonyola
Sengwe R.


a Gorge
Nyamaparka
Sanyati R.
17
Gulungwe R.
Gungukwe R.
G A
Kumbanyama
Katamangwe
Masasen
3080
Mangwe
INYOKA
Drop 500
Dumba
18
3960
29